

# Chemical Week

March 15, 1958

Price 35 cents



Final word on '57—new crop of annual reports closes book on year of change . . . . . p. 28

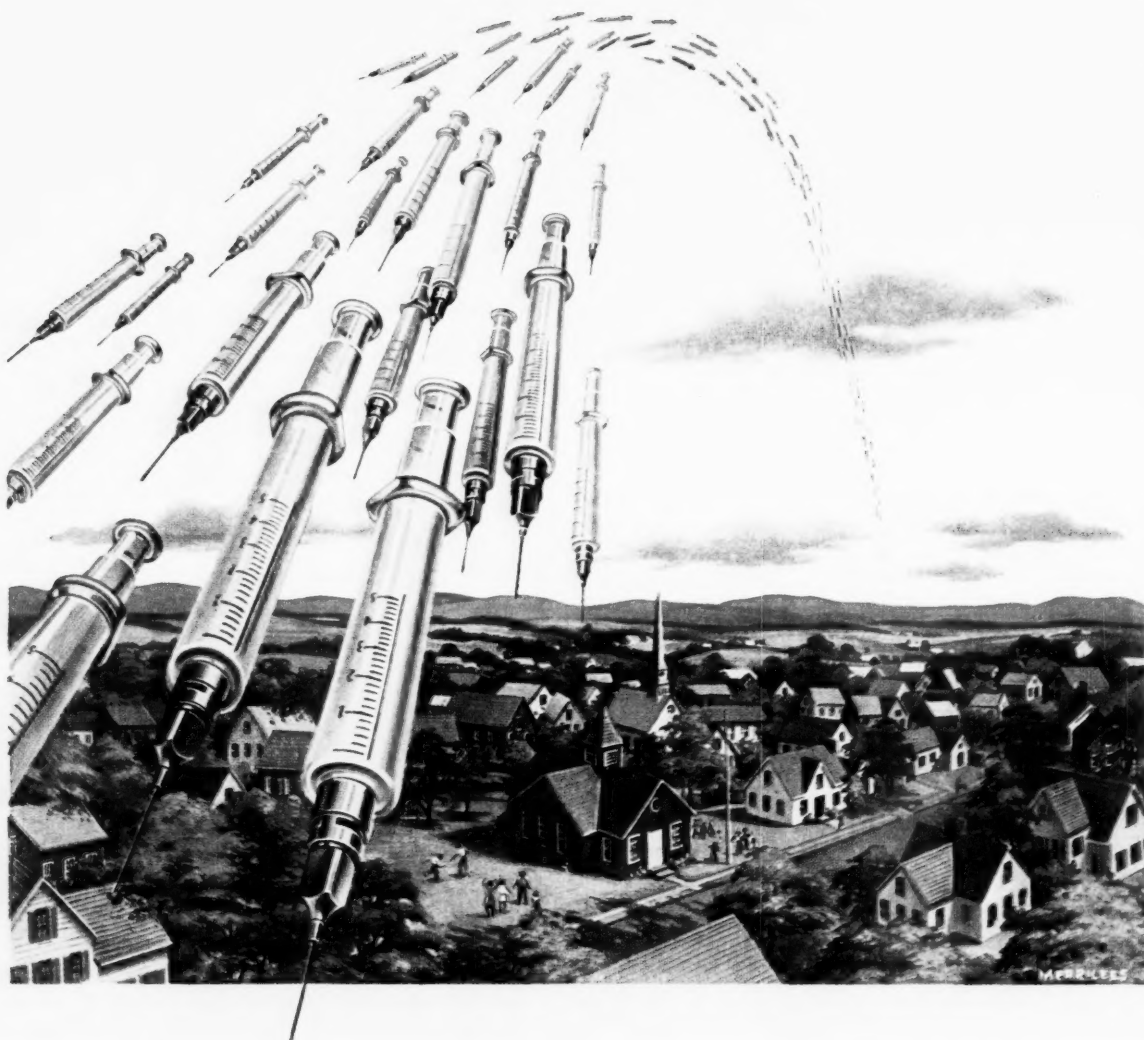
Mergers play hob with research management. How five firms met the challenge . p. 39

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ANN ARBOR MICH  
APR 15 1958  
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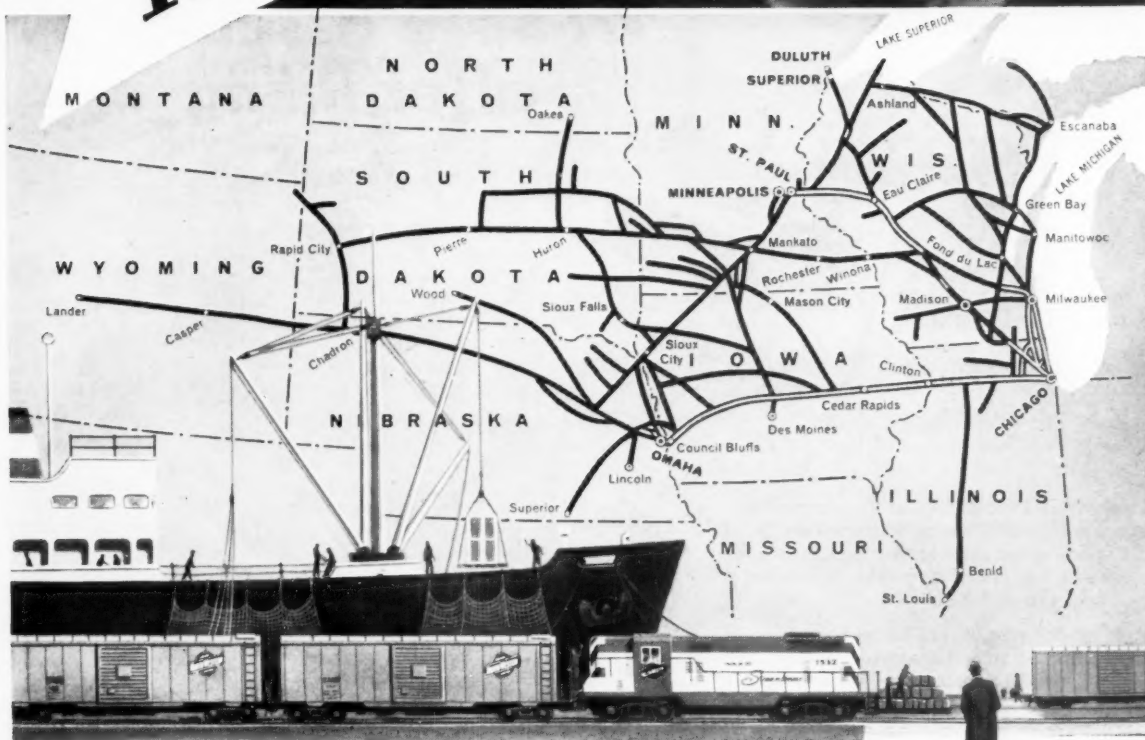
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Chemical Week • March 15, 1958

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- **Pick your maintenance chief with care**—he will be playing a stronger role in production .....p. 55

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Atomic Industry Forum forecast on nuclear power for next 10 years promises annual \$150-320-million

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96 U.S. Polymeric licenses American Reinforced Plastics to use its heat-resistant resins.

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Pulp- and papermakers show off water pollution control improvements.

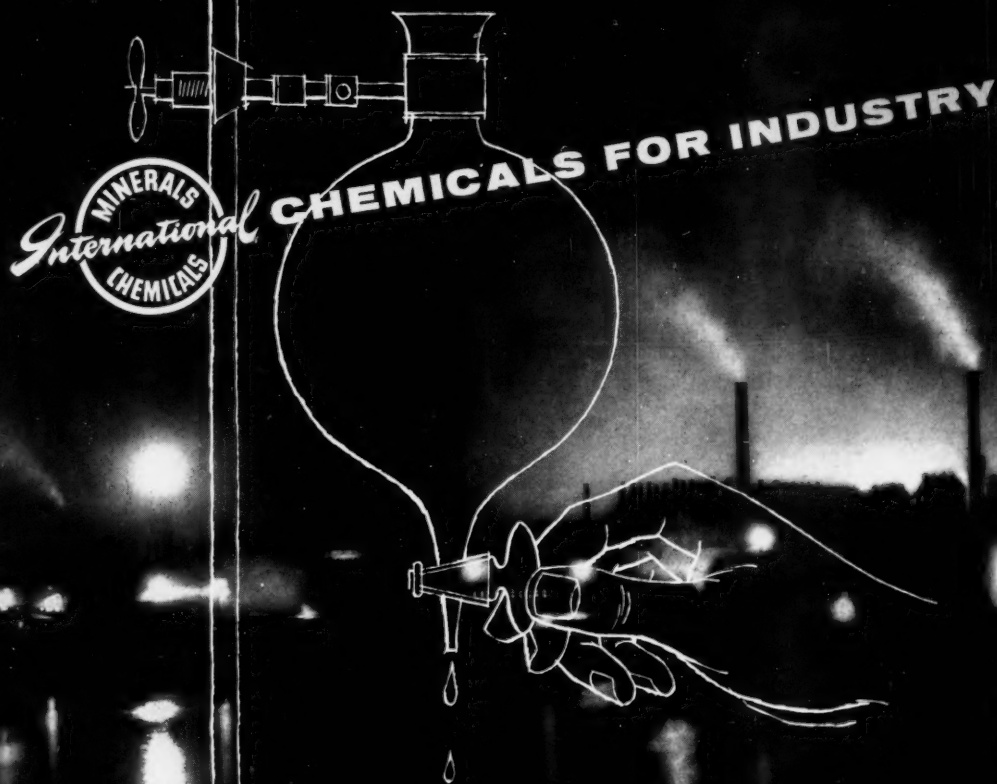
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No. 11

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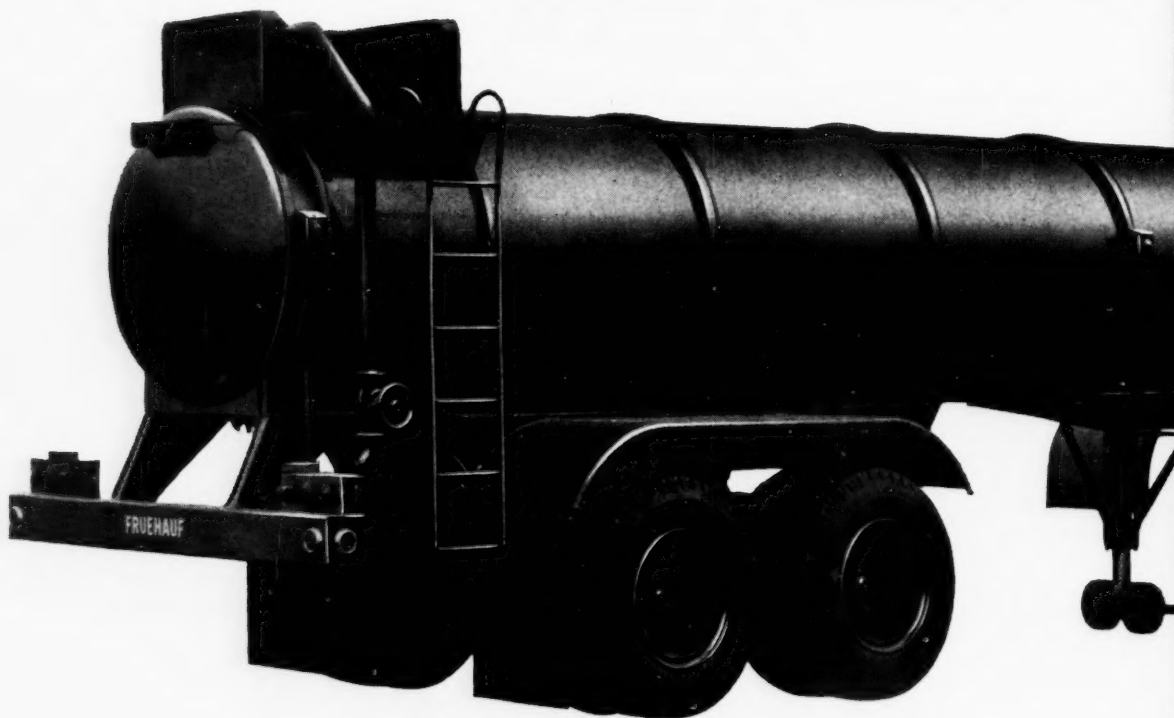
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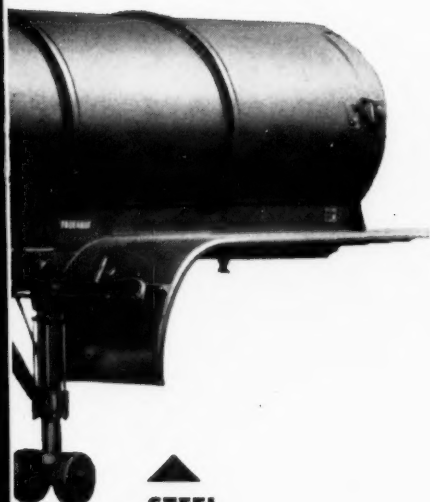
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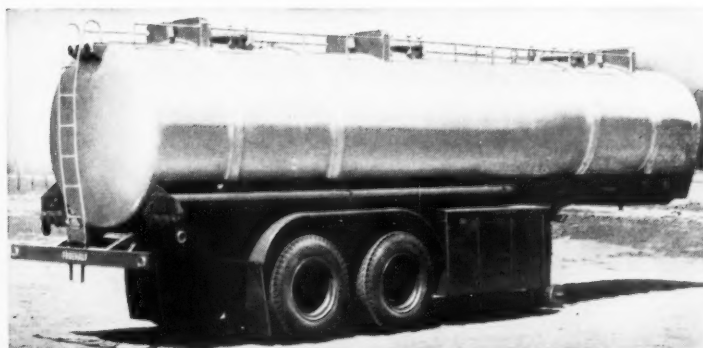


## STEEL

THIS EXTERNALLY BRACED 3350 gallon steel acid transport is a single compartment "cleanbore" unit designed for fast, safe loading and easy cleaning of such commodities as caustic soda, various acids, and other liquid chemicals. It is equipped, as specified, with or without front fenders, and standard safety features include a manhole splashguard and drainpipes for removal of spills. Constructed to I.C.C. Code MC311, A.S.M.E. inspected. Compartmentalized steel units with bulkheads and baffle-heads and a wide variety of optional features are also available.

## STAINLESS STEEL

THIS INSULATED, compartmentalized stainless steel acid tank carries up to 400 more gallons of payload than steel units of equivalent dimensions. The corrosion resistant qualities of thinner, stronger stainless steel, plus scientific design and internal bracing, make the unit practically indestructible.



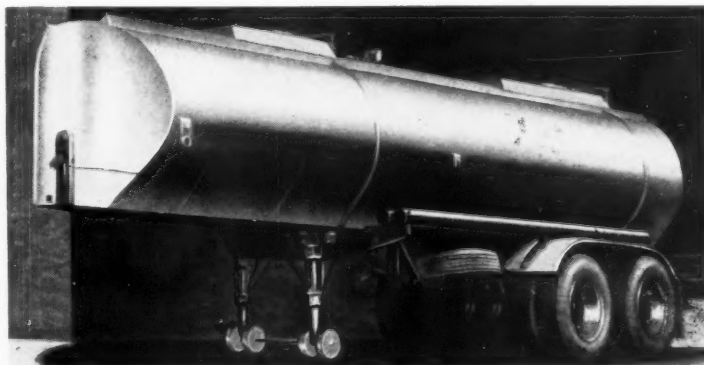
## EXTERNALLY BRACED ALUMINUM

THIS EXTERNALLY BRACED drop-frame 5400 gallon aluminum tank with three easily cleaned compartments hauls a multiplicity of chemicals and weighs in at the low figure of 9000 pounds. Money-making safety features include double aluminum bulkheads, toe rails on both sides, 3" aluminum emergency valves, smoothly ground internal welds, and many optional selections.



## INTERNALLY BRACED ALUMINUM

THIS INSULATED, INTERNALLY BRACED, 3-compartment, 4500 gallon aluminum tank weighs only 8925 pounds equipped with tire carrier, aluminum wheels, stiff leg supports, adjustable upper coupler, double bulkheads, aluminum emergency-valves, curbside discharge, full-length guarded walkway, two 6" hose carriers, fenders, I.C.C. lights and wiring, steam coils, and 2" insulation.



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*There's a new way to sell life insurance, air transportation, cigarettes and many other things today. Now, too, a new way to sell your product to the Chemical Process Industries . . .*

# of Tomorrow in today's CPI selling!

With costs up clear across the board and slated to climb even higher in '58 — the "profit squeeze" is as punishing on you as it is your customers. That's why the old way of trying to sell "everybody" has priced itself out of business . . . especially in the high "net"-minded Chemical Process Industries. *A "new" sales approach is inevitable!*

As the CPI marketplace mushrooms — more plants and more people — the cost and confusion of going after every reputed "buyer" becomes prohibitive. But your own good sense insists that growth doesn't thin out buying power. Quite the contrary, it concentrates more authority into the most logical hands . . . *CPI-Management.*

More plants mean added profit responsibility for the men who authorized the expansion. More technicians and chemists — greater responsibility for their performance by the men who hired them. And *when you mention profits and performance*, you can only mean *CPI-Management* in all functions . . . from right at the top in *administration to production and plant operations, design and construction, research and development, sales and purchasing.*

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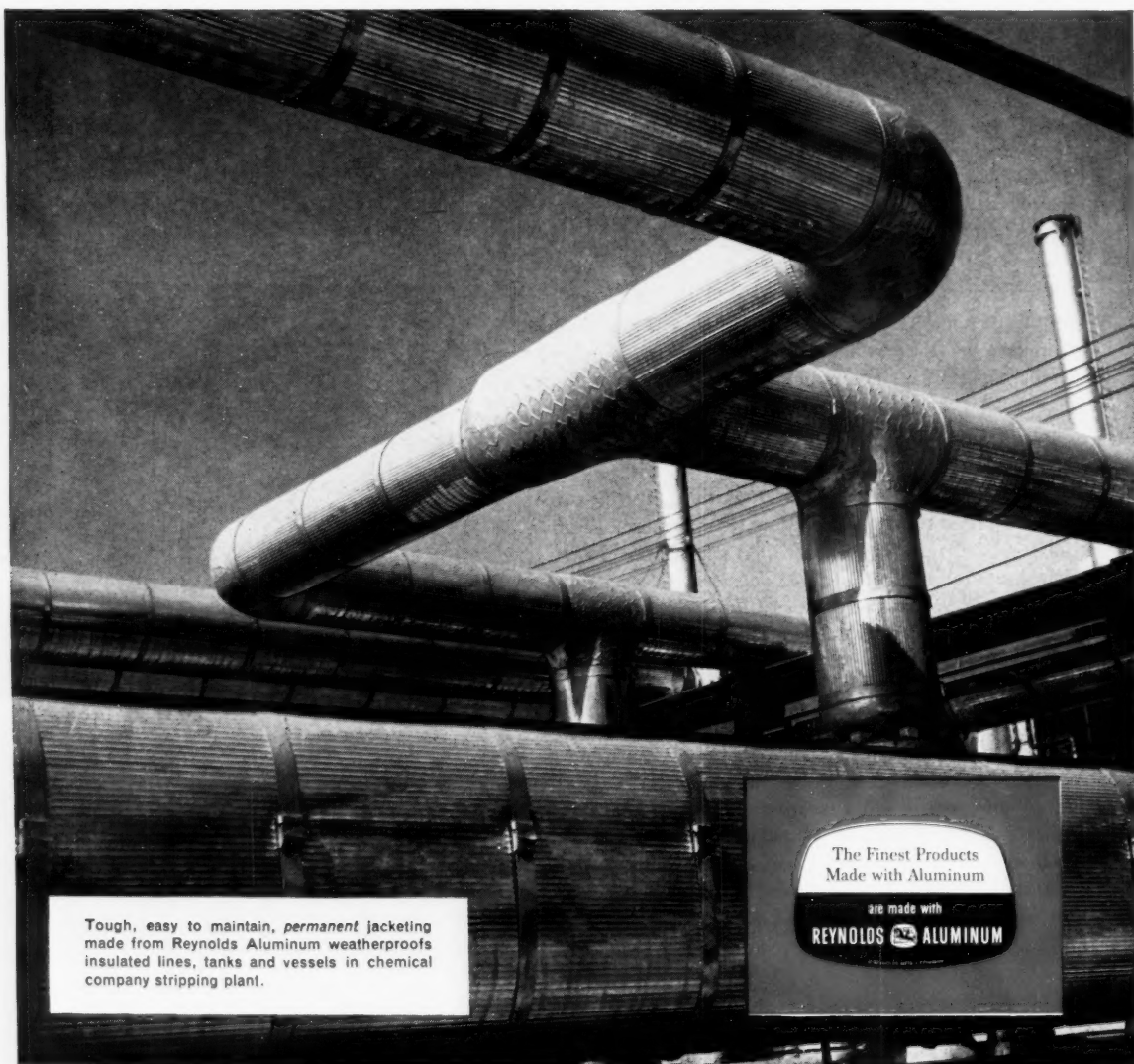
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# Aluminum Jacketing

...how it improves appearance,  
cuts installation, maintenance costs



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are made with  
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Aluminum is the one permanent jacketing material, a material that stays clean and new-looking with a minimum of upkeep. And that holds true in the toughest jobs in the chemical and petroleum processing industry. Jacketing made from Reynolds Aluminum cuts costs in many other ways, too. Here's how:

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Many industrial atmospheres, chemicals, gases and contaminants literally eat jacketing materials away. But they don't bother aluminum. Reynolds Aluminum Jacketing stays strong, clean and rust-free in the most corrosive atmospheres, handling the most corrosive materials, in any climate or weather condition. *And it needs no repetitive maintenance.*

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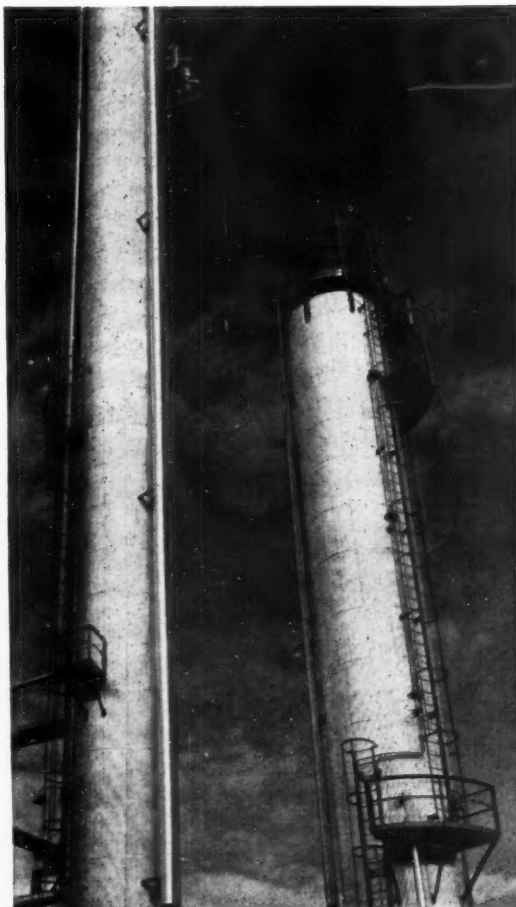
Lightweight aluminum is one of the most workable, formable of metals. That means faster, easier installation, and less time and labor on the site. You can cut and shape Reynolds Aluminum Jacketing with ordinary hand tools, and can use larger sheets because it is so light. Weighing only  $\frac{1}{8}$  as much as steel—or less—aluminum jacketing can save in shipping, handling, installation and supporting structure costs.

### GOOD INSULATION PROPERTIES

Aluminum jacketing has a low factor of emissivity—it keeps heat *inside*—a big added advantage when you're handling or storing hot fluids. Then too, aluminum reflects as much as 95% of radiant heat. That means it protects volatile products from costly evaporation losses.

### NON-SPARKING

Flammable and explosive materials are safer when aluminum is used for jacketing or handling equipment, because aluminum is non-sparking and won't burn.



Suntide Refining Co. tower in platforming and reformatting unit—jacketed in Reynolds Aluminum.

Of course, aluminum's properties are important to chemical and petroleum processing men in other applications as well as jacketing. In process pipe, for example, or oil country pipe, where Reynolds Aluminum's light weight and weldability saves hundreds of man-hours on installation. Tanks and vessels, heat exchangers, drilling rigs and offshore rigs are all using more and more aluminum, too.

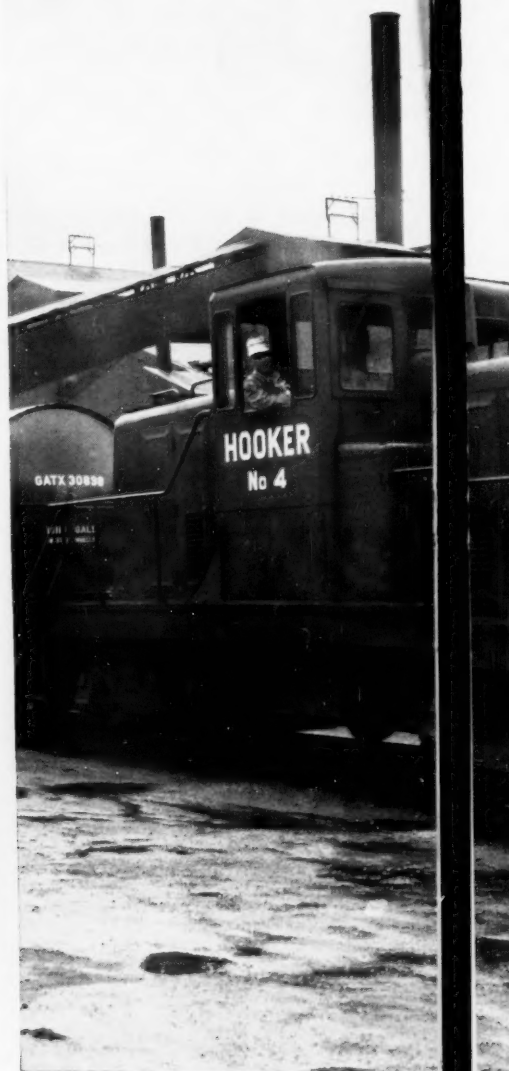
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# REYNOLDS ALUMINUM

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**CROSSETT CHEMICAL COMPANY'S 45-TON LOCOMOTIVE** plays an important role in their wood distillation and tall oil operations in Crossett, Arkansas. This company uses their G-E 45-tonner seven days a week, eight to ten hours per day to move raw materials and for other important switching operations.



**HOOKER ELECTROCHEMICAL COMPANY'S 65-TON LOCOMOTIVE**, a powerful 550-horsepower unit, gets wide use at their important

**PUTTING PLANT TRACKS TO WORK . . . .**

## How General Electric Locomotives Help Three Large Chemical Companies Increase Profit Margins, Speed Material Handling



Niagara Falls, New York plant. This locomotive, pictured above, can and does handle all switching operations in this plant with ease.



TENNESSEE PRODUCTS AND CHEMICAL CORPORATION owns and operates ten General Electric locomotives . . . two 25-tonners, one 45-tonner, two 65-tonners and five 80-ton units. According to plant personnel at Lyle, Tennessee, these locomotives "get the jobs done on time and are available for duty 24 hours a day."

The operations carried on by the three chemical companies described above have two things in common: getting raw materials in . . . getting processed goods out. These companies rely on General Electric industrial locomotives for these vital operations. They agree that:

**G-E LOCOMOTIVES SAVE MONEY** because they require little maintenance, use low-cost fuel, have no complicated, expensive-to-repair gears and transmissions, and are available up to 95 percent of the time for key plant haulage jobs.

**G-E LOCOMOTIVES ARE FAST AND EFFICIENT.** A press of the starter button puts a G-E diesel-electric locomotive on the job. High tractive power—the kind of power often needed for chemical plant material handling—is readily available. Locomotives are doubly efficient because they let

these companies put their existing plant tracks to more profitable work.

**G-E LOCOMOTIVES GIVE LONG SERVICE** because General Electric industrial haulage specialists work with you to select the right locomotive to meet your haulage requirements. Complete parts and parts service is as close to you as your nearest General Electric Apparatus Sales Office.

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Other products in Wyandotte's complete line for the urethane-foam industry include:

PLURONIC\* L61. This polyoxyalkylene glycol was one of the first polyethers available for the manufacture of urethanes, and continues to be widely used in resilient urethane foams. With its unique structure — involving primary hydroxyl groups — Pluronic L61 can be used alone or with tetrafunctional polyethers, such as Tetronic\* 701. By varying the combination of polyether components, specific foam properties may be obtained.

TETRONIC 701. This polyoxyalkylene derivative of ethylene diamine has been used extensively with Polypropylene Glycol 2000 and Pluronic L61 for cross linking and imparting load bearing characteristics to urethane foams. An integral part of the polyol requirement, Tetronic 701 has become an essential ingredient in many formulations.

QUADROL\* (N, N, N', N'-tetrakis [2-hydroxypropyl] ethylenediamine) has proved an excellent cross-linking agent and catalyst for urethanes, particularly rigid foams. With four hydroxyl groups and two tertiary nitrogens, Quadrol produces excellent cross linking and tack-free foams in less time than normally required.

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These materials have been thoroughly investigated in our laboratories, and field tested and approved . . . inquiries are invited on any or all of them. Literature and samples are available. Please send requests on your company letterhead.

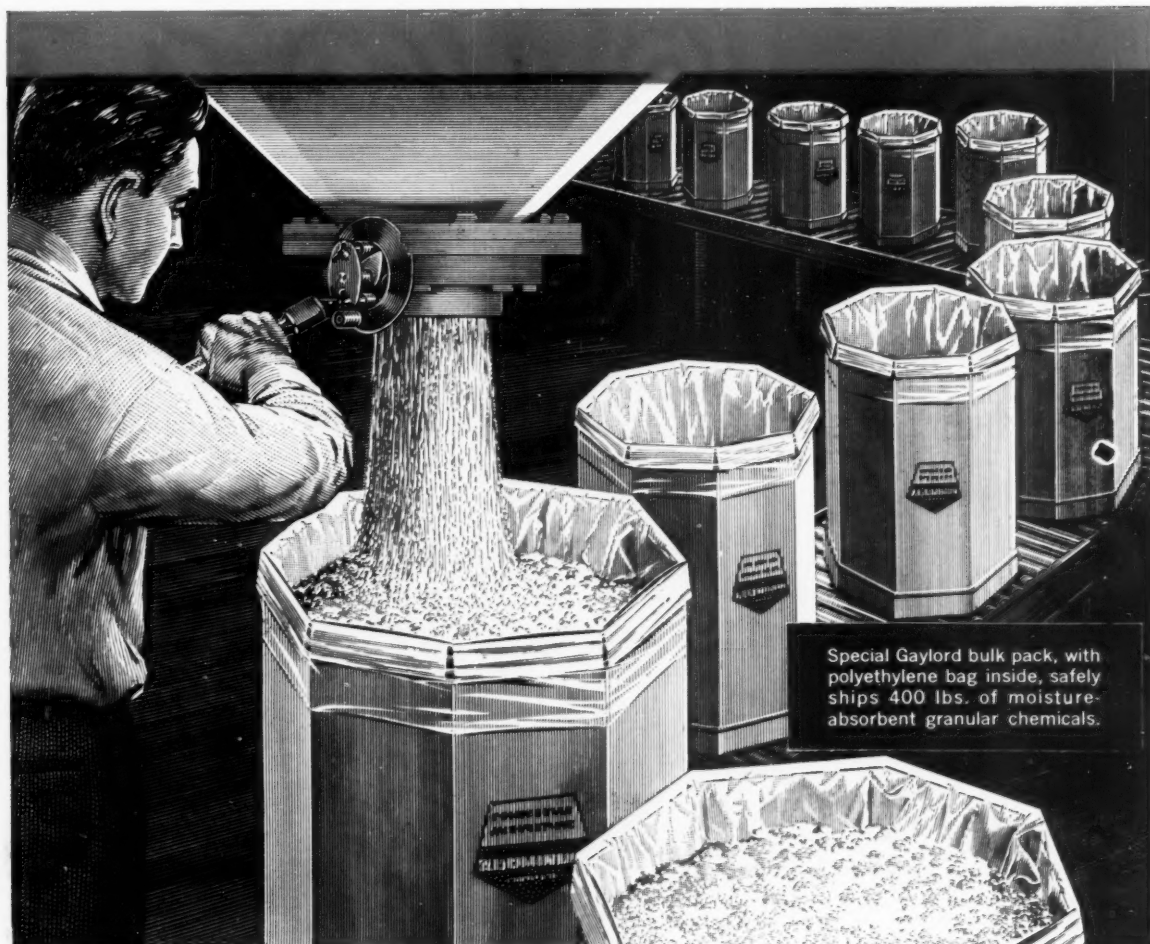
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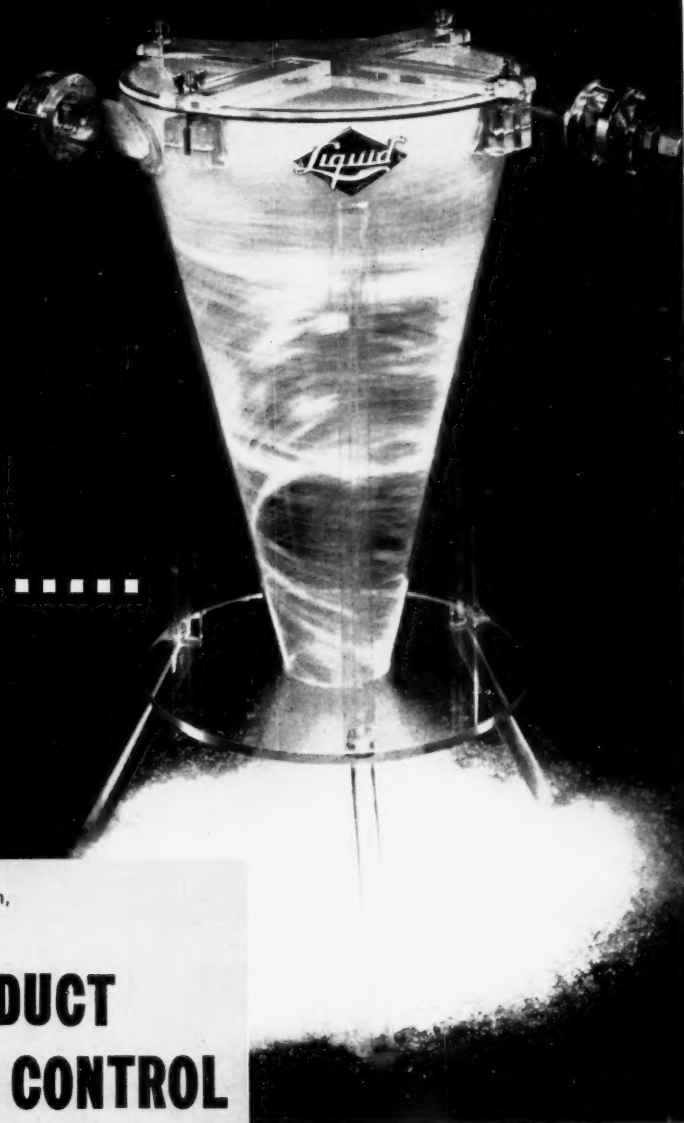
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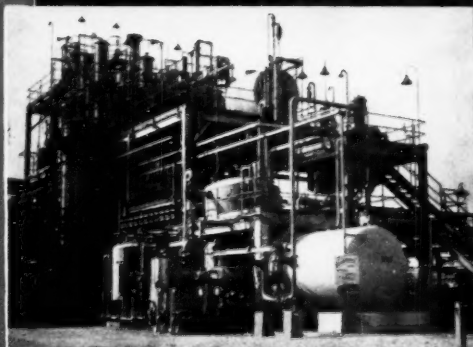
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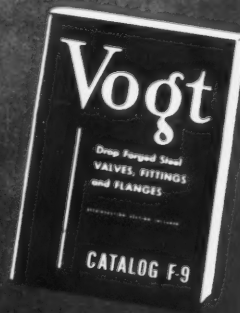
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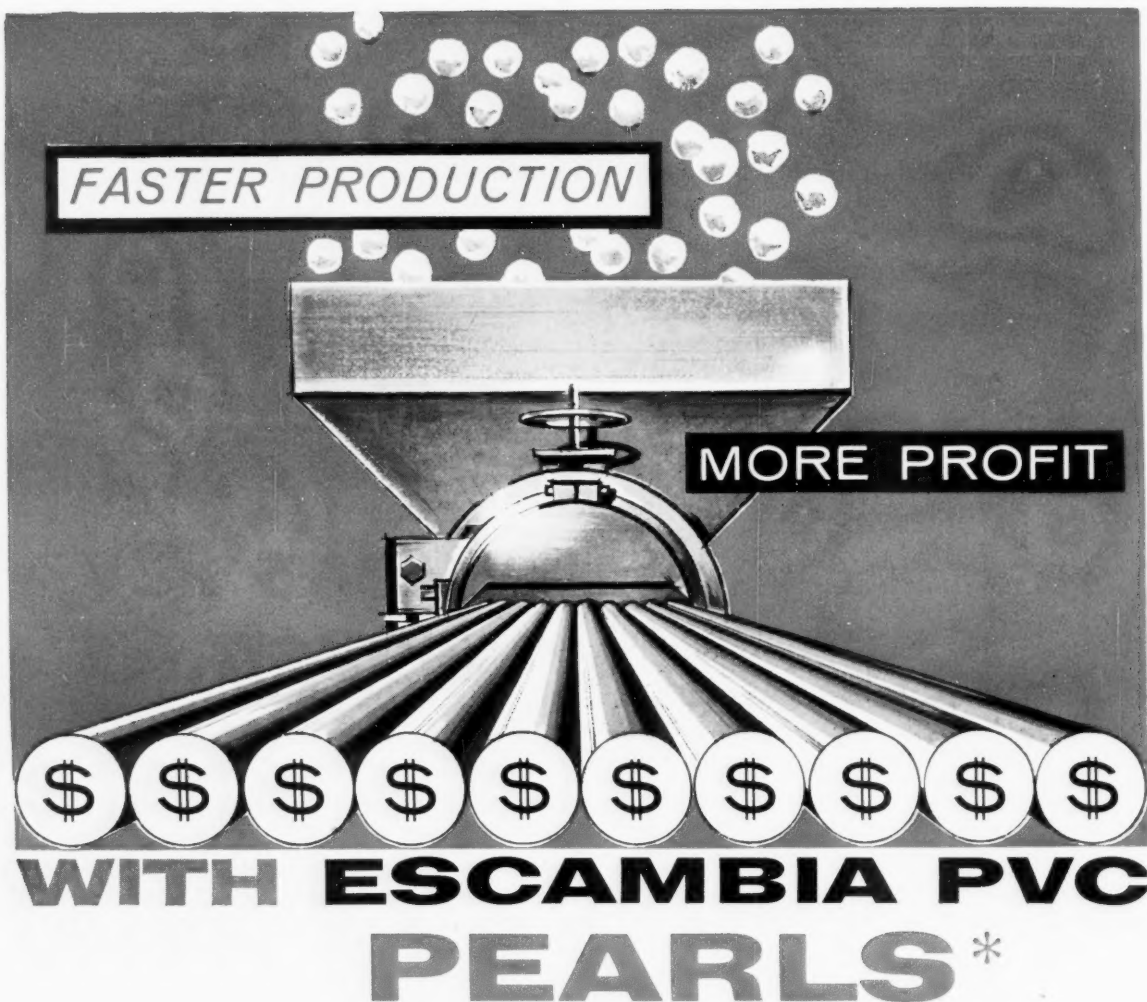
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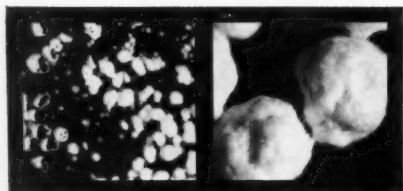






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- ▲ Complete freedom from fines
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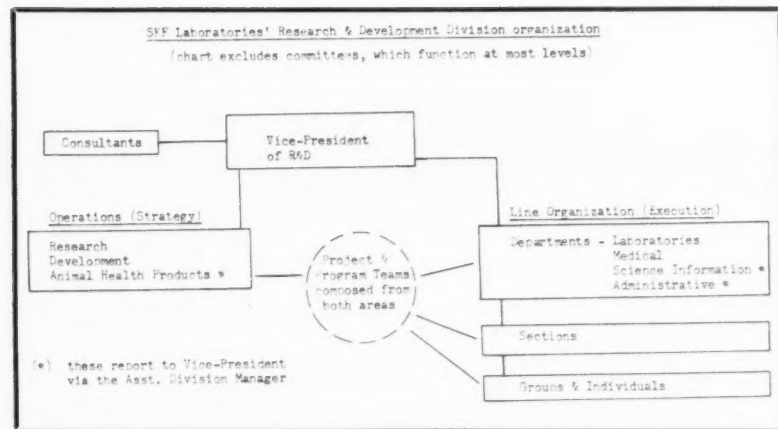
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Chemical Week • March 15, 1958



# OPINION



# MEETINGS

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RICHARD C. BOSTWICK  
Smith, Kline & French Laboratories  
Philadelphia

Above (chart) is SK&F's unsimplified version.—ED.

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TO THE EDITOR: Small plant management in the chemical specialty industry utilizing batch processes with his kettles, tanks, mixers and packaging equipment needs help and guidance in the field of cost accounting.

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I believe this would be a fertile

field for your magazine. We need a well-designed, standard cost-accounting system and in detail. Stuff the small man can utilize *en masse* or adapt to his needs . . .

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President  
Hindman Products  
Morgantown, W.Va.

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TO THE EDITOR: In reference to "Sodium Sulfate Output" (*CW, Feb. 23, p. 97*):

There's a new use for commercial sodium bisulfate, which contains, as a "so-called" inert ingredient, sodium sulfate. A mixture of approximately 96% of this chemical plus about 2% of an oxalate and, optionally, about 1% each of sodium dichromate and sodium gluconate or glycerine or both, is now used as a superior pickle, bright-dip or electrobright-strip for alloys of copper, silver and/or gold. This replaces fuming acids such as nitric and sulfuric with excellent results.

LESLIE L. LINICK  
Chicago

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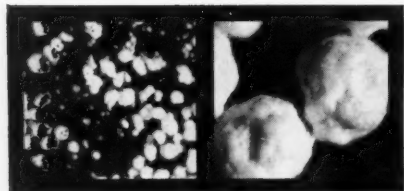
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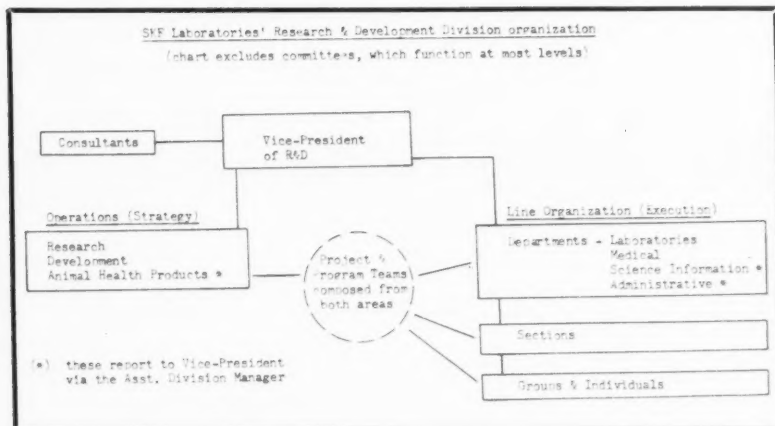
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# The Year Advertising Helped

**I**N 1954 we had a business recession in the United States. Sales fell about 4% during the year. If management had followed the historic pattern of business ups and downs, advertising volume would have fallen much further.

*But in 1954 the volume of advertising did not fall. It increased over 5%, and expenditures in all major advertising media rose. Every effort was made to stimulate sales when sales were needed to sustain prosperity.*

This was something entirely new under the sun. It had a powerful influence in making the recession of 1953-54 one of the mildest on record. It helped greatly to speed business on to the record-breaking levels it attained in the years 1955-57.

There are several reasons why America's business management attacked this decline in sales with more advertising. One of them grew out of the greatly strengthened position of the American consuming market. Consumers' income after taxes has been rising an average of over \$10 billion a year since 1946, and this rising income is more widely distributed than ever before. Furthermore, consumers had piled up reserves of about \$200 billion in cash or its equivalent. These reserves offered a new and powerful inducement to increased selling and advertising effort even in the face of a possible decline in consumer income. (At the end of 1957, consumer reserves were \$225 billion.)

## *Taking the Longer View*

*However, the principal reason why a sales decline was attacked*

This editorial message was first published by McGraw-Hill two years ago. It describes advertising's dramatic contribution to the American economy during 1954. The theme of the editorial—that advertising can help promote economic stability by stimulating sales at a crucial time—is even more pertinent today.

As our economy grows, it is constantly changing. The conditions business faces today are not the same in every respect as those it faced in 1954. But business again has the opportunity, through advertising and other selling efforts, to help sustain a high level of economic activity. At the same time, it will be building markets for the period of renewed expansion that is sure to follow.

This editorial is reprinted exactly as it appeared in 1956, except for minor editorial changes to bring it up to date. Permission is freely extended to newspapers, groups or individuals to quote or reprint all or parts of the text.

*Donald C. McGraw*

PRESIDENT

McGraw-Hill Publishing Company, Inc.

*with increased advertising is management's new-found conviction that good advertising is essentially an investment in the development of a market. Successful development requires sustained investment. The inclination of business management to take this longer view is, of course, motivated*

# McGraw-Hill PUBLISHING COMPANY,



H E A D Q U A R T E R S F O R



# Kill a Business Recession

by the fact that the American market, with over 3 million consumers being added annually, is growing at a prodigious rate.

Ten years ago only a handful of companies had plans for investment in new producing facilities extending beyond the current year. Today almost all leading companies have investment programs running some years ahead. And keeping pace with these long-range investment plans has been the development of sales and advertising programs to reach tomorrow's greatly expanded markets.

## *Advertising's Key Role*

This crucial role of advertising in providing driving power for our economy is gaining greater recognition every day. In his book, "People of Plenty," Professor David M. Potter of Yale University remarked: "Advertising is not badly needed in an economy of scarcity, because total demand is usually equal to or in excess of total supply, and every producer can normally sell as much as he produces. It is when potential supply outstrips demand—that is, when abundance prevails—that advertising begins to fulfill a really essential economic function."

Today abundance so completely prevails in the United States that it has been conservatively estimated that as much as a third of everything offered for sale falls in the realm of "optional consumption." That is, consumers can "take it or leave it" without any immediate personal inconvenience. But if they decide to "leave it," a terrific

economic depression will not be far behind. In such circumstances, advertising—in which, in all of its forms, we are now investing over \$10 billion annually—clearly is of crucial importance to our continued prosperity.

In performing its key role in past years, American advertising never realized its full potential. It successfully promoted sales. But it never was called upon to promote an overall economic stability as a direct outgrowth of increased sales.

By successfully promoting both sales and economic stability, as it did in 1954, advertising surely has added new strength to the American economy. It has also added a great new and constructive dimension to advertising itself.

One of the surest means of expanding your sales volume in today's industrial markets is through dominant advertising in the publications directly serving your major customers and prospects.


McGraw-Hill's business and technical publications can give you quick access to the men who initiate, specify and approve the purchases of industrial products and services. Because all are leaders in their respective fields, you are assured a maximum return on your advertising investment when you *concentrate* in the McGraw-Hill publications serving your most important markets.

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March 15, 1958 • Chemical Week





three to make  
ready for outer space...

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TRONA\* is basic  
in the chemistry  
of high energy fuels  
and solid propellant  
oxidants.

Wherever men make ready for outer space...from barren arctic IGY laboratories to tropical ballistic missile blast-offs...Trona chemicals are putting the punch into high energy fuels and other propulsion systems. As the only basic producer of these three important raw materials used in high energy fuels and as solid propellant oxidizers—BORON, LITHIUM and AMMONIUM PERCHLORATE—American Potash & Chemical Corporation has a vital stake in the space age. Recipient of the 14th Annual Chemical Engineering Achievement Award for pioneering work in the atomic age metals, Trona continues in the forefront of basic research and technical development of these vital chemicals and their compounds for high energy and missile applications.



**American Potash & Chemical Corporation**

3000 West Sixth Street, Los Angeles 54, California  
99 Park Avenue, New York 16, New York

Offices: LOS ANGELES, NEW YORK, CHICAGO, SAN FRANCISCO,  
PORTLAND (Ore.), ATLANTA, COLUMBUS (O.), SHREVEPORT

Plants: LOS ANGELES AND TRONA, CALIFORNIA; HENDERSON, NEVADA; SAN ANTONIO, TEXAS  
(American Lithium Chemicals, Inc. & San Antonio Chemicals, Inc.); WEST HANOVER, MASSACHUSETTS



\*TRADENAME AND TRADEMARK OF AP&CO

*Recipient of 14th Annual Award for Chemical Engineering Achievement in BORON and LITHIUM*

Other Trona chemicals for high energy propulsion: POTASSIUM PERCHLORATE • LITHIUM NITRATE • LITHIUM PERCHLORATE • LITHIUM METAL  
RUBIDIUM & CESIUM • TRIMETHYL BORATE • TRIMETHOXYBOROXINE • DECARBORANE • ELEMENTAL BORON • BORON TRICHLORIDE • BORON TRIBROMIDE

# Business Newsletter

CHEMICAL WEEK

March 15, 1958

Though recession troubles were mounting this week, there was an upsurge in stock prices—major chemical companies' shares showed particular strength.

During the seven trading days through Monday noon (March 10), the Dow-Jones average for 30 industrial stocks rose 3.03%; but the average for seven of the largest chemical concerns climbed 11.23%. Among these chemical stocks, top gains over the period were 18.4% by American Cyanamid, 17.3% by Dow Chemical.

But in Washington, the report that unemployment reached 5.17 million in mid-February and might hit 6 million this week caused the federal government to gear for the country's most serious postwar recession—deeper and longer than the 1953-54 downturn and more severe than the 1949-50 slide.

President Eisenhower is against any new "WPA-PWA" programs. But he does favor some increased public works spending, and he's serious about asking Congress to provide money for payments to persons who have been out of work long enough to use up all state unemployment benefits.

•  
Whatever happens this year, the longer-range prospect looks good to most CPI spokesmen. This is the recurrent theme in statements this week by various chemical company presidents, and it is backed up by their latest expansion developments (*see also p. 28*).

Du Pont—which last week decided to go ahead with plans to double Dacron capacity by adding a 65-million-lbs./year unit at Old Hickory, Tenn.—says it spent a record \$220 million for expansion and modernization last year, compared with \$157 million in '56. The firm reiterates that it is carrying on six major construction projects right now (*CW, Jan. 25, p. 23*): high-purity silicon in North Carolina, Orlon in Virginia, cellophane in Kansas, titanium pigments and dimethyl terephthalate (DMT) in Tennessee, and Delrin acetal resin in West Virginia.

Freeport Sulphur is going ahead with its \$119-million Cuban-American Nickel Co. project, says the U.S. needs additional productive capacity for sulfur.

Texas Gulf Sulphur will spend about \$7 million for capital improvements this year, compared with \$6.6 million in '56 and \$10.8 million in '57.

Early next month, Metal & Thermit Corp. (New York) will dedicate its \$3.5-million organometallic chemicals plant at Carrollton, Ky. Products will include dibutyl tin maleate, tetraphenyl tin, and tributyl tin acetate.

## Business

### Newsletter

(Continued)

American Potash & Chemical Corp. has started building a \$4.5-million sodium chlorate plant near Aberdeen, Miss. Its capital spending last year was \$6.25 million, more than 50% above the '56 outlay.

•  
**Add two more to the rash of foreign synthetic rubber plants** abuilding or projected:

- Poland has started work on a 36,000-metric-tons/year unit at the Oswiecim (Auschwitz) Chemical Combine. It will turn out semi-finished buna rubber, will be outfitted by the U.S.S.R., and is scheduled to start production by mid-'60.

- The Brazilian government is blueprinting a \$40-million, 40,000-tons/year plant. It will probably be built near the government-owned Petrobras refinery, still under construction near Rio de Janeiro.

Already, four other rubber projects have been launched in foreign countries since the beginning of the year—two in the Netherlands (*CW Business Newsletter*, Jan. 11 and 25), one in West Germany and another in Italy (*CW*, March 1, p. 20).

•  
**A corporate shift coming up in Canada:** Heyden Newport Chemical Corp. (New York) will sell its 50% interest in St. Maurice Chemicals Ltd. (Montreal, Que.) to Shawinigan Water and Power Co. (Montreal), subject to approval by Quebec's Provincial Electricity Board. To pay for this acquisition, Shawinigan would give Heyden Newport 75,000 new-issue shares of Shawinigan common stock (market value about \$1.8 million), thus giving the U. S. concern a bit more than 1% interest in Shawinigan. Shawinigan then would transfer the St. Maurice stock to its wholly owned chemical subsidiary, Shawinigan Chemicals Ltd., which already owns the other 50% of St. Maurice.

•  
**Investors' confidence in chemicals** is reflected in Olin Mathieson's successful offer late last week of \$40 million worth of 5½% subordinate debentures, convertible into common stock. The issue, completely sold last Thursday at 100%, was being traded the next day at 102. Principal purpose of the financing: to redeem \$39 million worth of debentures and preferred stock—issued by Mathieson Chemical before its 1954 merger with Olin Industries—that contained covenants considered to be "unrealistically restrictive" for a firm of OM's size.

•  
**Losing out in last year's battle for control of Metal & Thermit** Corp. (*CW*, April 20, '57, p. 32) has'nt discouraged the insurgent group led by director Alexander Rogers.

At the annual meeting April 10, this group will seek stockholder approval of an antitrust suit against American Can Co. and certain M&T directors. One allegation: that Canco's 21.6% stock interest in M&T violates the Clayton Act, inasmuch as both firms have vinyl coating businesses totaling more than \$1 million/year.



# N&W research has proved the locations of multi-million ton 97.8% pure limestone deposits



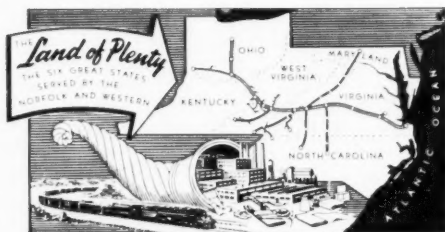
To a trained geologist, outcroppings such as these mean abundant limestone, but the scope and depth of the beds can be determined only through test drillings.

Norfolk and Western plant location specialists and consulting geologists have found in *The Land of Plenty* a vast source of top-grade limestone. One location alone is estimated to contain more than 100 million tons!

The beds range in thickness up to 100 feet, and the percentage of purity is almost 100%. Moreover, this limestone is easily accessible . . . which means increased operating economy for manufacturers needing high quality calcium or dolomitic limestone.

These statements are backed up by facts obtained through extensive research in the field and the laboratory. All findings have been confirmed and are open to your inspection.

Our plant location specialists will be glad to provide detailed information . . . in confidence and without obligation. Let them give you the facts on limestone and other advantages of *The Land of Plenty*.



The thoroughness of N&W research is depicted by this photo. Extensive drillings were made, and cores were sent to an independent geologic laboratory for scientific testing.

## And here are typical analyses\*

	DHL-1-1	DHL-1-2	DHL-1-3
SILICA (SiO <sub>2</sub> ).....	36%	30%	34%
IRON OXIDE (Fe <sub>2</sub> O <sub>3</sub> ).....	.072	.043	.049
ALUMINA (Al <sub>2</sub> O <sub>3</sub> ).....	.21	.20	.19
LIME (CaO).....	55.00	54.90	55.40
MAGNESIA (MgO).....	.65	.62	.51
SULPHUR (S).....	.012	.011	.015
PHOSPHORUS (P).....	.006	.006	.009
IGNITION LOSS.....	43.20	43.50	43.20
CALCIUM CARBONATE.....	97.90	97.72	98.51
(Calculated)			
MAGNESIUM CARBONATE.....	1.36	1.30	1.07
(Calculated)			

\*Report prepared by Pittsburgh Testing Laboratories, Pittsburgh, Pa.

The minimum of dark spots in this typical test core indicates premium limestone — ideal for chemical lime, calcium carbide and other important processed materials.

Write, wire or call—

L. E. Ward, Jr., Manager  
Industrial and Agricultural Dept.  
Drawer CW-795 (Phone Diamond 4-1451, Ext. 474)  
Norfolk and Western Railway  
Roanoke, Virginia

# Norfolk and Western RAILWAY

## Profit Margins Dwindle to Two-Year Low

	Sales 1957 (\$ million)	Change from 1956 (percent)	Net 1957 (\$ million)	Change from 1956 (percent)	Profit Margin 1957 (percent)	Sales 4th qtr. 1957 (\$ million)
<b>Air Reduction</b>	190.0	up 11.9	16.5	up 4.7	8.7	49.1
<b>Allied Chemical</b>	683.1	up 2.1	43.4 <sup>(1)</sup>	down 7.7	6.4	161.7
<b>American Cyanamid</b>	532.5	up 6.4	51.3	up 16.0	9.6	140.3
<b>American Potash</b>	42.8	up 2.6	4.7	down 7.8	11.0	10.2
<b>Atlas Powder</b>	70.0	up 4.3	3.8	down 10.3	5.4	16.7
<b>Catalin</b>	23.8	up 5.7	0.5	up 18.0	1.9	5.3
<b>Commercial Solvents</b>	65.9	up 5.4	1.5	down 51.3	2.2	19.4
<b>Diamond Alkali</b>	122.6	up 11.4	7.0	down 32.2	5.7	25.0
<b>Dow</b> <sup>(3)</sup>	657.7	up 5.2	57.5	up 2.8	8.7	170.9
<b>Du Pont</b>	1,964.6	up 4.0	265.7 <sup>(11)</sup>	up 4.3	13.5	469.6
<b>Foote Mineral</b>	24.9	up 0.8	2.3	up 2.7	9.3	5.6
<b>General Aniline</b>	138.4	up 3.6	5.4	up 5.1	3.9	35.5
<b>Hercules Powder</b>	245.3	up 4.0	18.1	up 2.3	7.4	57.3
<b>Heyden Newport</b>	48.5	up 16.1	2.6	up 1.1	5.3	11.6
<b>Hooker</b> <sup>(3)</sup>	107.9	down 1.9	8.8	down 23.0	8.2	28.0
<b>Interchemical</b>	109.8	down 1.1	3.9	down 16.6	3.6	26.9
<b>International Minerals</b> <sup>(4)</sup>	108.1	up 7.1	6.8	up 0.1	6.3	23.3
<b>Koppers</b>	326.3	up 6.8	9.4	down 21.9	2.9	89.0
<b>Merck</b>	186.9	up 8.4	23.0	up 13.9	12.3	48.4
<b>Monsanto</b> <sup>(5)</sup>	567.1	up 4.7	37.4	down 3.2	6.6	130.3
<b>National Distillers</b> <sup>(6)</sup>	538.5	down 0.8	23.0	up 1.7	4.3	145.9
<b>National Starch</b>	43.7	up 13.4	2.7	up 20.0	6.1	10.7
<b>Olin Mathieson</b>	592.9	down 0.9	36.4	down 9.7	6.1	144.4
<b>Pfizer</b>	207.2	up 2.1	22.9	up 25.5	11.1	56.9
<b>Pittsburgh Coke</b> <sup>(12)</sup>	54.1	down 9.3	2.3	down 28.4	4.3	13.3
<b>Pennsalt</b>	80.0 <sup>(10)</sup>	up 10.0	3.1 <sup>(10)</sup>	down 15.4	3.9	18.6 <sup>(10)</sup>
<b>Rayonier</b>	117.5	down 14.8	6.3	down 55.3	5.3	28.2
<b>Reichhold Chemicals</b>	65.3	up 10.3	2.3 <sup>(7)</sup>	up 32.9 <sup>(8)</sup>	3.6	15.0
<b>Rohm &amp; Haas</b>	174.1	up 6.1	15.6	down 2.9	9.0	41.1
<b>Stauffer</b>	157.0	down 1.3	13.1	down 4.7	8.4	35.1
<b>Texas Gulf Sulphur</b>	66.9	down 20.9	17.6	down 37.6	2.6	14.5
<b>Union Carbide</b>	1,395.0	up 5.3	133.7	down 10.9	9.6	350.1
<b>Victor</b>	52.2	up 4.1	3.7	down 0.1	7.0	12.8
<b>Wyandotte</b>	85.0	up 6.8	4.8 <sup>(13)</sup>	up 7.6	5.6	22.0

(1) Excludes \$7.8 million from sale of U.S. Steel stock.

(2) Excludes \$365,000 tax credit.

(3) 12 months to Nov. 30; (4) 12 months to Dec. 31.

(5) Figures exclude revenue from partly owned companies and foreign subsidiaries.

(6) Figures adjusted for income from National Petro-Chemicals.

March 15, 1958

## But Upturn's Sighted

Change from 4th qtr., 1956 (percent)	Net 4th qtr. 1957 (\$ million)	Change from 4th qtr. 1956 (percent)	Profit Margin 4th qtr. 1957 (percent)
up 6.6	4.1	down 0.9	8.2
down 5.1	10.5	down 12.1	6.5
up 11.6	14.6	up 35.2	10.4
down 3.4	1.1	down 19.0	11.3
down 2.1	0.8 <sup>(2)</sup>	down 17.2	4.5
down 3.5	0.1	down 0.7	1.7
up 4.0	(-0.2) <sup>(9)</sup>	down 122.9	—
down 3.1	0.9	down 65.4	3.5
up 0.1	14.8	up 8.2	8.7
down 5.2	62.2 <sup>(11)</sup>	down 10.5	13.3
up 6.7	0.5	down 22.5	9.1
down 5.7	1.6	up 6.9	4.4
down 1.9	4.4	up 10.2	7.7
down 3.4	0.5	down 4.5	4.2
up 0.3	2.4	up 8.7	8.5
down 5.1	1.2	down 16.4	4.3
down 0.7	0.9	down 26.7	3.8
up 7.5	2.4	down 9.2	2.7
up 13.2	5.5	up 15.3	11.3
down 3.1	6.4	down 34.5	4.9
down 5.4	8.1	up 7.2	5.2
up 6.2	0.6	down 13.8	5.7
up 2.3	7.6	down 14.7	5.3
up 13.8	7.4	up 50.5	13.0
down 14.3	0.3	down 62.9	2.0
up 6.3	0.5 <sup>(10)</sup>	down 25.0	2.7
down 11.6	1.3	down 55.1	4.7
down 3.6	0.3	down 35.4	2.0
down 3.6	4.0	down 19.5	9.8
down 1.2	2.6	down 14.9	7.5
down 24.6	3.8	down 40.3	2.6
down 0.9	30.1	down 24.4	8.6
down 4.3	0.9	down 11.6	7.8
up 6.3	1.1	up 35.4	5.1

(7) Excludes \$675,000 from sale of investments.

(8) '56 excludes \$104,000 from sale of investments.

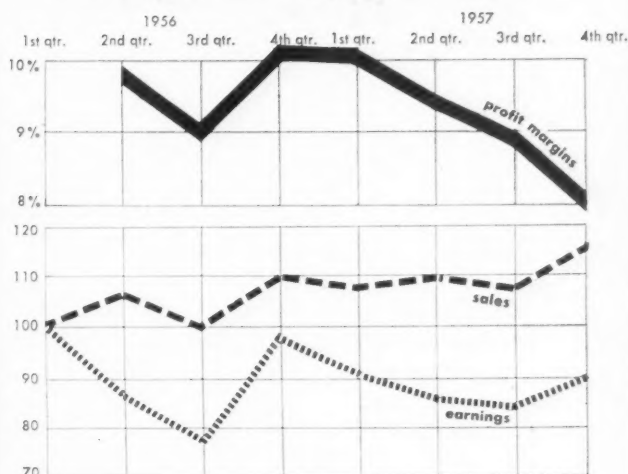
(9) Loss; (10) CW estimate.

(11) Operating income.

(12) Figures exclude all income and revenue from Ct. Lakes Steamship Co.

(13) Excludes \$2.1 million from sale of Alpena quarries.

## CW Earnings Index



Here's how the figures graphed above are computed.

**SALES AND EARNINGS:** Sales of 25 carefully selected chemical companies are totaled for each quarter. Sales for the first quarter of 1956 is taken as the base figure and expressed as 100. All other quarters are assigned an index number related to this base. After-tax earnings are computed in the same way.

**PROFIT MARGINS:** The aggregate after-tax incomes of the same 25 companies are divided by their aggregate sales and the resulting decimal expressed as a percentage. An average of the individual profit margins would not be statistically meaningful.

No adjustments are made for seasonal changes.

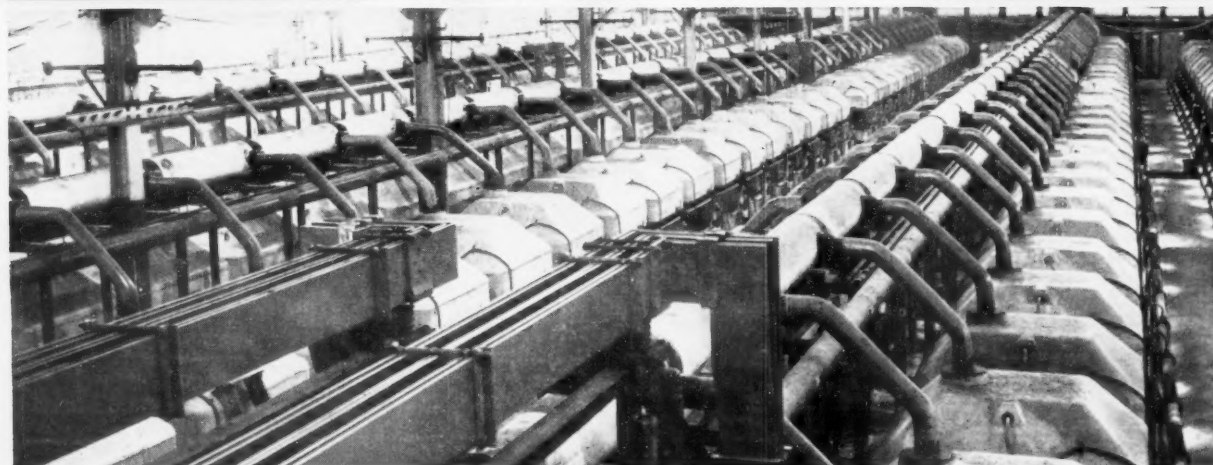
**R**ugged fourth-quarter '57 competition and a "make do" inventory policy among CPI customers have dragged the CW profit-margin index to its lowest point in two years—8.04%.

And even those companies that managed to counter the squeeze aren't looking for better results in the January-to-March period. Exception: pharmaceutical firms.

Pharmaceutical makers—helped by sales of "flu" and polio vaccines as well as tranquilizers and other new items—were the only group to chalk up meaningful gains in '57. They see substantial profits this quarter, too—but their full '58 outlook is "cautiously optimistic."

The four companies that did manage more than a 5% profit increase in the fourth quarter report the boost appears to be the temporary result of special circumstances—e.g., a scheduled price increase that caused flurries of last-minute buying, extraordinary year-end accruals, and fortunate sales of high-profit items.

But management takes a brighter view of the long-term outlook. Most agree that an upturn is on the way. Consensus: the downward trend will level out sometime in April—then, after four or five months, will start up again.



Before and after: Old Vorce electrolytic cells (top) were replaced by Hooker-type cells (bottom).

## Building and Drilling Rejuvenate



First of Westvaco's three new caustic barges hits the water.

Payoff on a \$15-million plant rescue project will be symbolized next week with the expected arrival of the new FMC-101, a chemical tank barge, at South Charleston, W.Va. It will take on its first load of caustic soda from the rejuvenated plant of Food Machinery and Chemical Corp.'s Westvaco Chlor-Alkali Division.

This built-to-order barge—and its two sister vessels, scheduled to be delivered late this summer—will haul to market the early fruits of Westvaco's \$7.5-million caustic-chlorine plant expansion and modernization, a project that has boosted caustic soda capacity more than 30%, to 460 tons/day.

**Unit Costs Climbing:** When FMC acquired the old Westvaco Chlorine Products Corp. in 1948, the plant was more than 30 years old and falling behind competitors in unit costs. FMC kept the plant in production and rebuilt it, unit by unit. During the



# Mass Boost for Hormones?

Use of hormones as oral contraceptives is the main point of interest in a lecture series in Japan this week. It could be a first step toward world-wide mass marketing of products for that purpose.

Three U.S. scientists\* are speaking to various Japanese professional and scientific groups on a subject of potentially explosive import: the effectiveness of certain steroid hormones in promoting and inhibiting fertility in the human female. The topic—seldom discussed by pharmaceutical firms here—is especially significant in Japan, which for decades has been struggling with the problem of feeding its rapidly increasing population.

Several products that seem to be effective in this role are already on the market in the U.S., or are being readied for the market—e.g., Norlutin (Parke, Davis & Co.), Enovid (G. D. Searle & Co.), Prodox (Upjohn & Co.). Hormones with similar properties are being tested by Schering AG in Germany and by British Drug Houses Ltd. in the United Kingdom (*CW*, Sept. 21, '57, p. 58).

**Temporary Sterility:** But these products are being offered and recommended for treatment of specific menstrual disorders only, and are available only on physicians' prescriptions. It appears that they have considerable importance in such applications as promoting regular menstrual cycles, initiating ovulation and preventing miscarriages due to lack of progesterone.

Interest in the possible value of some of these hormone products as contraceptives stems from their apparent effectiveness in inducing temporary sterility without harmful side effects, when taken orally. It's believed that they prevent the pituitary gland from causing the ovary to discharge an egg cell, and that this action ends as soon as the patient stops taking her daily doses of the hormone.

Aside from the religious and moral considerations, lack of sufficient testing is keeping U.S. producers from applying to the Food & Drug Admin-

istration for clearance of these products as oral contraceptives. All that's required for such clearance is convincing evidence that the products would be safe when used as directed. There's no federal regulation prohibiting manufacture or marketing of contraceptives, oral or otherwise. One section of the Food and Drug Act does, however, empower FDA to proceed against producers and distributors if their products are not effective for the purposes specified.

While there's considerable evidence that no great danger is involved in taking such hormones for a short period (several months), there's no certainty of what the effects of continued use of these products over a long period (five years) might be.

In Japan, religions, mores, and social and economic pressures are considerably different from those in the U.S. If the current lecture tour there should lead to wide use of these products, both as oral contraceptives and for other medical purposes, it might well set the stage for recognition and general use in the U.S. and other countries.

## Patent Policy Study

AEC last week launched a public re-examination of its entire patent program. The announcement came just when the U.S. Supreme Court ruled on the heavy-hydrogen process case. The decision tends to support inventor Jerome Spevack's contention that something is wrong with the commission's patent policies.

Last November, AEC said it planned to re-evaluate its patent program, and invited companies and individuals to send in written comments. Now, AEC is inviting all interested persons to come to a public meeting April 15. Those planning to attend should write to AEC immediately, listing name, subject to be discussed, and approximate time required.

The high court ruled that the court of appeals was wrong in holding that Spevack had no right to a trial (*CW*, Nov. 23, '57, p. 48). It ordered the appeals court to hear the case on its merits and determine whether "declassification" of Spevack's process amounted to "publication."

\* Dr. Edward Tyler, director, Infertility Clinic, School of Medicine, University of California (Los Angeles); and Executive Vice-President Alejandro Zaffaroni and Research Vice-President Carl Djerassi, both of Syntex (Mexico City), which develops and produces hormone preparations from vegetable materials.



From new source, better brine.

## an Old Plant

revamping, Westvaco searched the state for new salt deposits, hoping to free the plant from dependence on Louisiana and Michigan salt.

Last summer, the search paid off. Drillers struck rock salt at Bens Run. Wells will yield high-concentration brine that will enable Westvaco to speed reprocessing.

**Starting with Bisulfide:** Westvaco started the face-lifting in '52 by replacing its batch-type carbon bisulfide unit with a \$3.5-million plant, completed in '54. The next year, a \$2.5-million addition began producing anhydrous ammonia.

Coming onstream this year: a modernized unit that will boost carbon tetrachloride capacity 110%, and Westvaco Mineral Products Division's 6-million-lbs./year unit for di- and trichlorocyanuric acid and the sodium salt of dichlorocyanuric. In '59, the plant will complete a multimillion-dollar boiler modernization.

## COMPANIES

**Dow Chemical Co.'s** Texas Division will close its magnesium unit at Plant B, Freeport, Tex., for an indefinite period, will put it on stand-by. Plant A magnesium production is expected to continue at about its present rate.

**Charles W. Berg Laboratories** (Philadelphia) is back in business under a new name: Berg Laboratories, Inc. The firm closed after a plant explosion in 1954 killed 11 firemen and injured 25 other people; damage claims of \$1.5 million exceeded the company's assets. The new firm will produce textile processing chemicals on a "limited operations" basis.

**Dixon Chemical Industries, Inc.**, an affiliate of Dixon Chemical & Research, Inc. (Newark), will buy the assets of I. P. Thomas Division, Pennsalt Chemicals Corp. Dixon will pay about \$1.6 million for the facilities at Paulsboro, N. J. They include sulfuric acid, phosphoric acid and superphosphate plants. The acquisition is the first step in Dixon's expansion plans, which include building sulfuric acid decomposition and hydrofluoric acid units at Paulsboro.

**Canadian Chemical & Cellulose Co., Ltd.** (Montreal), reports a net loss of \$3.6 million for '57, compared with net earnings of \$41,369 in '56. Sales dropped from \$39 million to \$35.5 million. Reasons: strikes and reduced exports of chemicals to England and cellulose acetate to Latin America.

**Kaiser Aluminum & Chemical Corp.** has cut production 15% at its Tacoma, Wash., works.

## EXPANSION

**Cement:** Louisville Cement Co. will this year boost capital expenditures \$250,000 over its '57 outlay. The firm plans to spend \$3 million in '58—\$1 million for a new kiln and more than \$1 million for 12 new cement-storage silos at Speed, Ind.

**Polyvinyl Acetate:** Du Pont will build a unit to produce two new polyvinyl acetate emulsions at its Toledo, O., plant. The emulsions, a homopolymer and a copolymer, are designed for use in water-based paints. Plant completion date: early December.

**Polyethylene:** National Petro-Chemicals Corp. (New York) is constructing a 75-million-lbs./year high-pressure polyethylene plant in Houston. It's scheduled to go into production next winter.

Texas Eastman Co. (a division of Eastman Kodak) also will boost polyethylene production in Texas. The firm has awarded to Girdler Construction Division

(National Cylinder Gas Co.) a contract to expand capacity of Eastman's Longview plant to 85 million lbs./year. Increased output is slated to start by year's end, will include low- and medium-density types.

**Barium Monohydrate:** Sherwin-Williams Co. (Cleveland) is building a barium monohydrate plant at Coffeyville, Kan. It is due onstream next fall.

## FOREIGN

**Chemicals/East Germany:** Once-flourishing chemical plants in East Germany are to be rebuilt with Russian backing. Soviet sources say that an agreement, worked out last month, calls for repayment in the form of chemical products from reconstructed factories. The Soviet Union will supply materials for rebuilding the plants under what is described as a long-term loan on favorable terms.

**Chemicals/Mexico:** Farbenfabriken Bayer AG. (Leverkusen, Germany) is setting up Quimicas Unidas S.A. (Santa Clara) as a Mexican subsidiary, capitalized at 5 million pesos. A plant to produce insecticides and dye-stuffs is planned.

**Potash/Italy:** Recently discovered potash deposits in Sicily—which may prove to be among the world's largest and most important—are to be worked by three companies with more than \$35 million of financing by the World Bank. It's expected that these three projects—two in the district of Caltanissetta and one in Enna—will lead to greatly increased use of potash fertilizers by Italian industry.

Any surplus over domestic requirements should earn foreign exchange credits for Italy, as it seems likely that potassium sulfate can be produced more cheaply in Italy than elsewhere in Europe. One of the companies is also building a chlorine-caustic plant, suggesting that Sicily—which has abundant raw materials—may become a leading Italian chemical center.

**Plastics/Russia:** The Soviet Union is driving for accelerated development of polymer technology and production. This year's capital investments in plastics manufacture are up 150%, compared with '57's; in synthetic fibers, up 75%; in synthetic rubbers, up 48%. For the Russian chemical industry as a whole, capital expenditures this year will be 7.15 billion rubles\*, 53.6% greater than last year's.

Goals of the Russian researchers: chemically stable inorganic polymers with high heat resistance; manufacture of textiles from polymers without going through spinning and weaving processes; proteinlike polymers that might be able to catalyze certain reactions at low temperatures.

\*By U.S.S.R.'s official exchange rate, \$1.8 billion U.S. equivalent.

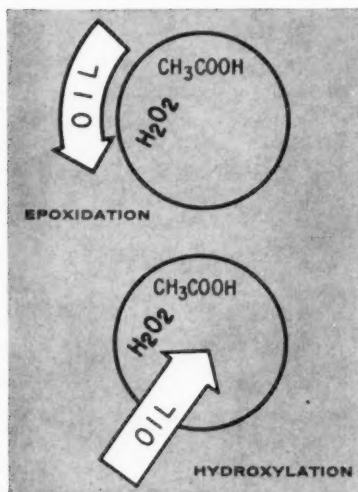


BETTER THINGS FOR BETTER LIVING  
THROUGH CHEMISTRY

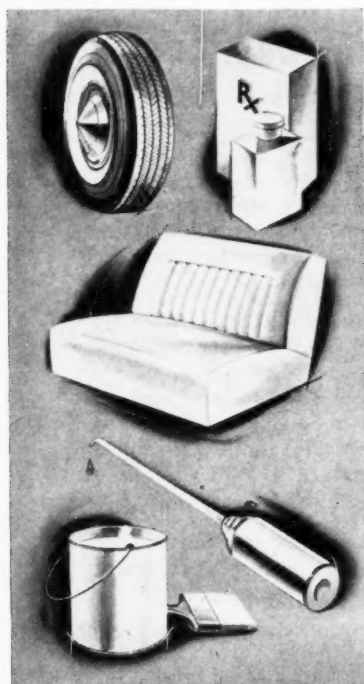
## PRODUCT NEWSLETTER

featuring **ALBONE<sup>®</sup>** hydrogen peroxide

### Progress report on Du Pont peroxygen research



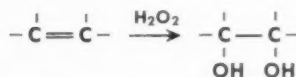
• Epoxidation seems to occur rapidly on surface of resin catalyst; in hydroxylation uniform penetration into the bead may occur and desorption is slow enough to allow hydrolysis of the epoxide to glycol.



• Epoxidation or hydroxylation can lead to improved coatings and resins, grease and lube additives, plasticizers.

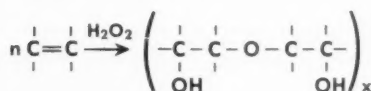
Du Pont's continuing research in peroxygen chemistry has resulted in the development of some new techniques which are commercially attractive. Our epoxidation procedures are examples of this research.

New along these lines is the recent contribution of Du Pont chemists in pioneering a one-step method for hydroxylating such materials as unsaturated fatty acid esters.



Prior methods required two steps and contributed to the hydrolysis of ester groups if they were present. The new method allows the retention of desirable ester groups. This is an important advance which may result in higher, purer yields of dihydroxy derivatives, and a more direct route to such products as brake fluids, rubber modifiers, paints and coatings.

The new hydroxylation technique provides an unexpected bonus in that a special adaptation of the procedure permits conversion of double bonds directly to polyether.



End uses for polyethers prepared in this fashion have not been established but one suggestion is that they may be used in preparing coating materials with improved alkali resistance.

#### Importance of the catalyst

The trick of these procedures is to choose suitable reaction conditions

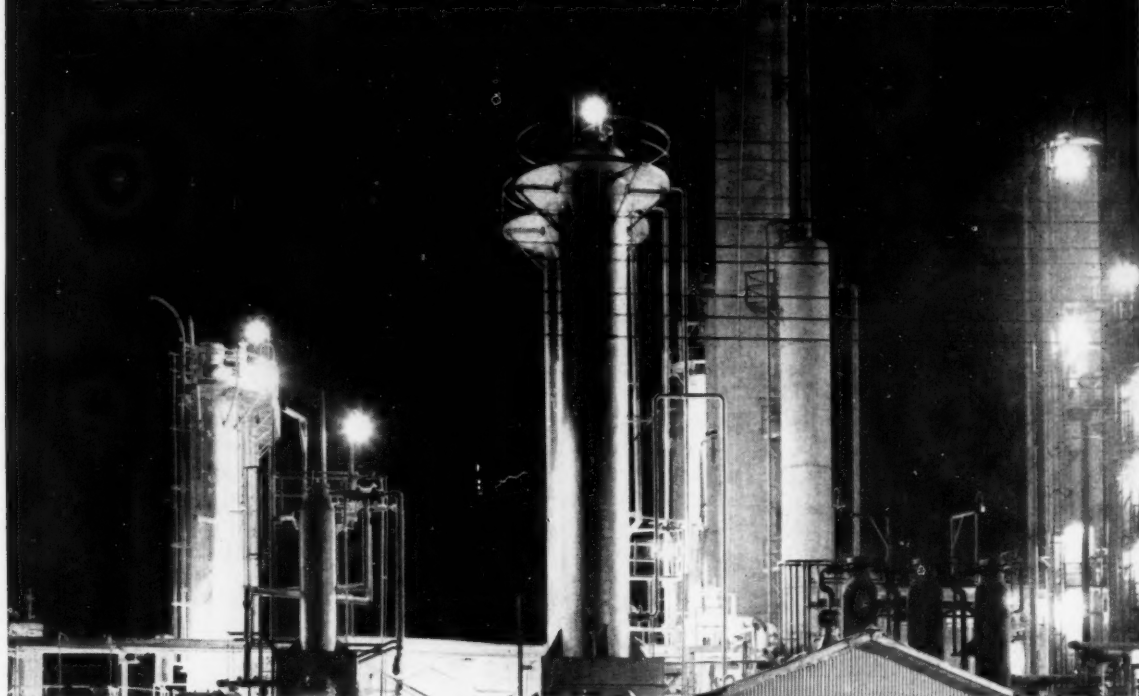
and the proper catalyst for hydrogen peroxide, depending upon whether you want epoxides, glycols or polyethers. Significant is the fact that the catalysts come from the same family of materials, and the determining factor in what products will be obtained appears to lie in how porous the catalyst beads are.

A glance at the accompanying diagram will show a simplified version of how these catalyst systems probably work. A non-porous catalyst is used in epoxidation; one that is involved in a fast surface reaction so that there is little time for the epoxide formed to be hydrolyzed to by-products. Hydroxylation requires a porous catalyst which the fatty ester probably penetrates uniformly over sufficient times so that glycol is formed. Given a long enough reaction period and a high enough temperature, the porous catalyst will form polyethers.

This is a Du Pont preview of processes which promise new efficiency when going directly from double bond to glycol or when going farther to polyethers. It's typical of the exploratory work Du Pont research chemists are doing to find new, profitable uses for hydrogen peroxide in organic chemistry. Streamlined hydroxylation and epoxidation techniques, two results of these efforts, may be applicable to your own research or processing. We'll be glad to help you with any application of hydrogen peroxide. Just write us on your letterhead at the address below.

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PEROXYGEN PRODUCTS DIVISION CW-3  
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# Washington

## Newsletter

CHEMICAL WEEK

March 15, 1958

### New federal aid-to-education subsidies are in trouble in Congress.

The Administration's much-touted, multifaceted program may be okayed in part; but there's almost no chance of Congress' buying the whole package. If Congress votes any education bill at all, this year, these measures stand the best chance of enactment: federal scholarship-fellowship help to needy students; expansion of the National Science Foundation's summer institutes of "brushup" courses for high school science teachers—Congress may even provide funds to extend the latter to grade school mathematics and science instructors.

Professional educators are dubious about the Administration's proposals; they much prefer the Democrats' program, providing more generous scholarship aid, plus flat grants to teachers who take career counselor training or attend summer institutes. Eisenhower's broader plan aims at much the same objectives, but is criticized as inadequate and too cumbersome, administratively.

### Congress will want to act soon to promote science education—

if only to impress the voters that it is alert to the Soviet scientific threat. But the lawmakers also want to adjourn early—and have just now started hearings on the 1,000-plus education bills tossed into the hopper in the wake of Sputniks 1 and 2. Thus, the odds favor a simplified school aid bill—or nothing.

And, there's still some risk of nothing being done. Congress could get bogged down in the multiplicity of conflicting proposals advanced by various education groups—including such controversial ideas as tax relief to teachers and scholarship donors.

Above all, there's the threat of Congress' becoming complacent over the need for education aid to keep stride with Soviet science. As one educator puts it, "I would feel much more certain of getting some action if the U. S. had a few more satellite failures."

•  
Proponents of stronger stream-pollution control think they are getting support from an unexpected quarter. Edward J. Cleary, executive director of the Ohio River Valley Water Sanitation Commission, notes that 37 states operate under laws requiring a company to have a state permit or approval of plans before discharging its wastes into a stream. "But," according to a recent survey, Cleary claims, "it appears that only half of the industries that are required to have a permit are meeting this obligation."

Other survey findings presented by Cleary to an audience of state and interstate water-pollution control administrators: only three states require annual review of such permits; only 16 demand monthly company reports on the amount and types of discharged wastes. Annual reports are specified by four states.

# Washington Newsletter

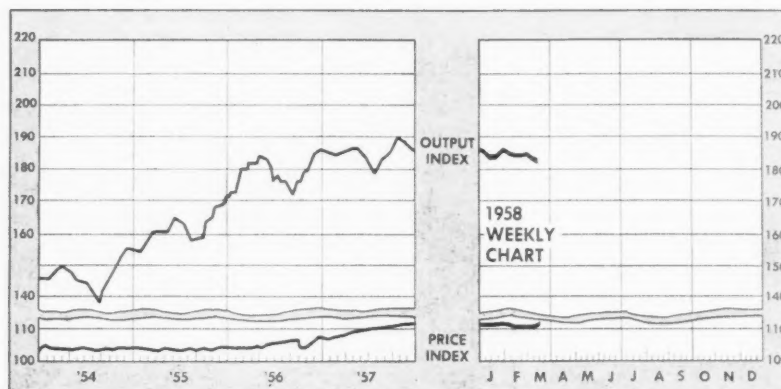
(Continued)

The rundown on state enforcement requirements and performance was supplied to Cleary by state pollution control leaders in advance of their recent three-day conference with U. S. Public Health Service officials.

Federal officials enforcing antipollution laws figure they stand a good chance of getting at least \$3 million from Congress this year to carry on their work. Appropriations Committee members seem to favor this kind of money for their program. If they get the full amount, this would be an increase of \$1 million over last year's budget.

**Depressed mineral markets and industries** will once again come in for the annual round of Senate committee hearings. Senator Murray's Interior Subcommittee will be asking the Commerce Dept. to come up with its estimates on the outlook for U. S. consumption of specific minerals. The Interior Dept. will be asked to predict the outlook for production. Among minerals to be covered: copper, lead, zinc, tungsten, chrome, beryl, manganese.

Bureau of Mines officials say mining firms are going through a rough adjustment from the Korean wartime boom to more normal peacetime needs. There's not much chance, most observers agree, of any substantial new government relief.



## Business Indicators

### WEEKLY

**Chemical Week** output index (1947-49=100)  
**Chemical Week** wholesale price index (1947=100)  
 Stock price index of 11 chemical companies  
 (Standard & Poor's Corp.)

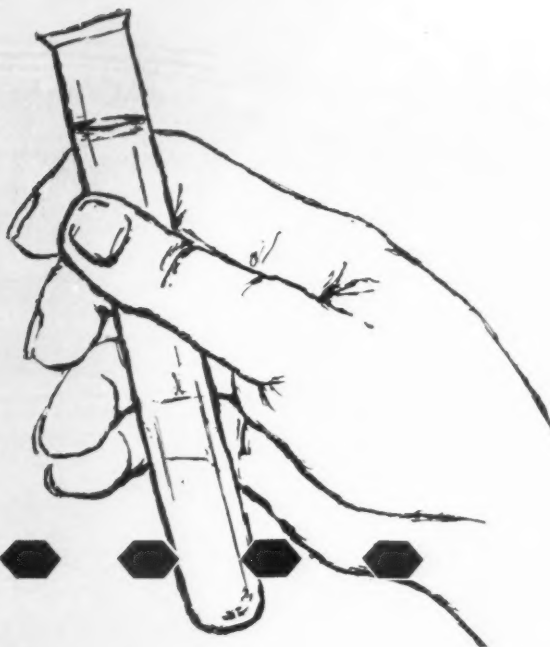
Latest Week	Preceding Week	Year Ago
182.5	183.5	185.5
111.0	111.0	108.7
39.21	39.14	41.89

### MONTHLY Employment (thousands)

	Latest Month	Preceding Month	Year Ago
All manufacturing	15,880	16,325	16,959
Nondurable goods	6,767	6,911	6,969
Chemicals and allied products	815.9	823.1	834.5

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CHEMICAL DIVISION

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Still another test conducted under severe Florida weather conditions compared an Isophthalic-based automotive refinishing enamel to several high quality Phthalic Anhydride based auto refinish enamels. The result? After 6 months of rugged weather exposure the Isophthalic-based enamel had over twice the gloss retention of the PA based products.

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# RESEARCH

## How They Solved Postmerger Problems

Companies caught up in the current wave of mergers may find it a tough task indeed fitting together contented, productive research staffs from personnel of combined firms. How will they solve the intricate problems of meshing research personnel? Where will they locate their main laboratories? How will they administer to the combined staffs? CW this week presents five firms' approach to these problems.

Because of the distinctive nature of each merger, no clear-cut "rules of reorganization" can be set, of course, but some guides useful to merger-minded firms are sketched.

**Placating Personnel:** Almost without exception, these five companies tried to settle personnel problems before they tackled anything else. Max Tishler, Merck Sharp & Dohme's president of the research laboratories division, puts it this way: "Don't rush into big administrative changes or laboratory relocations; solve the human problems first."

Among a firm's primary steps in this direction, Tishler believes, is proving that it values top-level personnel of both organizations: "It is best if the new firm can keep its scientific personnel on the vice-president and research director level; it's usually not hard to do. It pays to let a man keep his title, even if you change his duties and location. Sometimes this isn't possible, of course; but on the whole, the responsibilities of the key men are increased."

William Gage, president of Grace Chemical Co., division of W. R. Grace, points out that a merger usually brings growth, with "many new top-management slots to be filled."

Likewise, Minnesota Mining & Mfg. Co.'s Lyle Fisher says, "We have always tried, when acquiring a firm, to keep its research organization basically intact. In a few cases—on the basis of their personal background and interest—research personnel of an acquired company have transferred to the laboratory of another operating division or to one of the company's subsidiaries."

As a rule, top research men are



**Warner-Chilcott's Steinberg:** 'A party for 60 researchers helped calm anxieties about relocating from New York.'

**Heyden Newport's Herman Sokol:** 'Research labs should be kept where they are—near the plants they serve.'





**Grace Chemical's Gage:** 'A merger usually brings growth, with many new top-management slots to be filled.'

**Merck's Tishler:** 'Don't rush into big administrative changes or lab relocations; solve human problems first.'



less likely to leave if merged companies have dissimilar research objectives. Two men with similar reputations in the same field may find it hard to share the limelight.

More frequently, the increased size of the new research arm makes it necessary to create a post of greater importance than that which existed in either company before merging. For example, in a few weeks, Warner-Lambert (veteran of two mergers, two acquisitions in the past seven years) will install a vice-president of research and development. Until now, directors of each research department have reported directly to the president of the company.

**Relocation Resistance:** More likely to leave as the result of a merger are researchers at lower levels. They may become apprehensive about their chances of advancement in a bigger company, or resist relocation as not warranted by their new jobs.

Warner-Chilcott Laboratories (research arm of Warner-Lambert) turned up a novel solution of this problem, according to Eliot Steinberg, manager of research administration. When Warner (New York City) merged with Chilcott (Morris Plains, N.J.), about 60 Warner staffers were asked to move to New Jersey. Chilcott tossed a party for the 60, which helped soothe their anxieties about relocating. Only a few—and they were mostly younger researchers, some of whom were night-school students—left the company.

But when Warner acquired Harrower Laboratories (St. Louis—research branch of Lambert Co.) in '52, more than half of Harrower's staff resigned—indicating that the farther the move, the more likely there will be high turnover.

**Move the Labs?** What to do about personnel is just one of the questions shaping the decision on whether to move physical facilities or leave them alone. Much depends on what kind of research is being done.

Minnesota Mining, in most instances, kept not only acquired personnel but also research laboratories at the same location. Fisher, 3M's director of personnel and industrial relations, explains that, in most of the companies acquired, the research organizations were devoted primarily to improvement of existing products and processes and were, therefore, logi-



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## RESEARCH

cally kept at the site of product operations.

Fisher says, however, "From time to time, we find on the research staffs of acquired companies individuals whose background and interest seem more closely related to the activities of our central research laboratory in St. Paul, which concentrates on more fundamental and longer-range projects and on the development of products unrelated to existing product lines. In many cases these people have elected to join the central research staff."

Herman Sokol, Heyden Newport's vice-president of research, also believes in keeping research labs where they are—near the plants. Says Sokol, "Researchers get a better insight into the line of products they are working on, and their train of thought is not adulterated by the over-all research program encountered in a central laboratory. Good company communications will keep all researchers well informed, eliminate overlapping assignments."

Grace Chemical's Gage concurs, although his firm has centralized basic research at Davidson Chemical (Baltimore) while retaining other research units at some of its seven divisions.

Warner-Chilcott likes centralized laboratories because, says Steinberg, of "improved administration, communications, and cross-fertilization of ideas."

**Back to Normal:** Getting research reorganized may take a few months (Heyden Newport) or a few years (Merck Sharp & Dohme). Just when research may be considered to be normal again is a subjective thing, depending on when personnel are feeling at ease again, when lab space is being utilized to best advantage and when administrative lines are freed of kinks. In any event, reconsider the advice of Merck's Tishler: "Don't rush into big . . . changes or . . . relocations; solve the human problems first."

## PRODUCTS

**Antibacterial Compound:** Ions Exchange & Chemical Corp. (New York) has developed a new nontoxic, nonirritating antibacterial compound. Called Agosan-H-6, it's a complex silver compound and is odorless, tasteless, noncorrosive and water-soluble, according to the company. It's

designed for use in liquid soaps, shampoos, toilet goods, etc.

**Catalyst:** Anderson Chemical Co. (Weston, Mich.) is out with a new catalyst, vanadium oxytrichloride. Research amounts are available in 50-gm., 1-lb. and 2-lb. containers; production quantities are also available.

**Fluoro Entries:** Six new fluorine chemicals are available from Abco Chemical Co. (Jersey City, N.J.): fluorenone oxime, *p*-fluorophenol, monofluoroacetic acid, sodium and potassium monofluoroacetate, and ethyl fluoroacetate.

## LITERATURE

• Atomic Energy of Canada Ltd. (Ottawa) offers two free bulletins of interest to "hot lab" operators: "Decay Tables for Radioactive Isotopes" (Tech. Bulletin DK -2) tabulates the rate of decay of the more popular industrial radioisotopes; "Radioisotopes—What They Are and How They Are Produced" (Tech. Bulletin RP-1) contains background information on radioisotopes.

• "A Nice Fat Problem" is one of a series of research articles available (free) from Evans Research and Development Corp. (New York) on the theories, status and expected progress in combating the multibillion-dollar problem of fat rancidity.

• "The Physical and Thermodynamic Properties of Helium" is a detailed compilation of data and facts concerning the gas. It's available from William R. Whittaker Co. Ltd. (Los Angeles) for \$10.

• Butyl rubber researchers will be interested in two new studies on dimethylol phenol resin curing systems for butyl rubber, available from Thiokol Chemical Corp. (Trenton, N.J.). Bulletin 100-4 describes a system using Thiokol's Amberol ST-137 phenol formaldehyde resin; bulletin 100-4B is an evaluation of other dimethylol phenol resins that may be used for this purpose.

• Sylvania Electric Products Inc. is out with a technical bulletin, "Kul-grid 28, Nickel-Clad Copper Wire," which describes the chemical composition, mechanical properties, conductivity and resistivity of nickel-clad copper wire developed for work at high temperatures.



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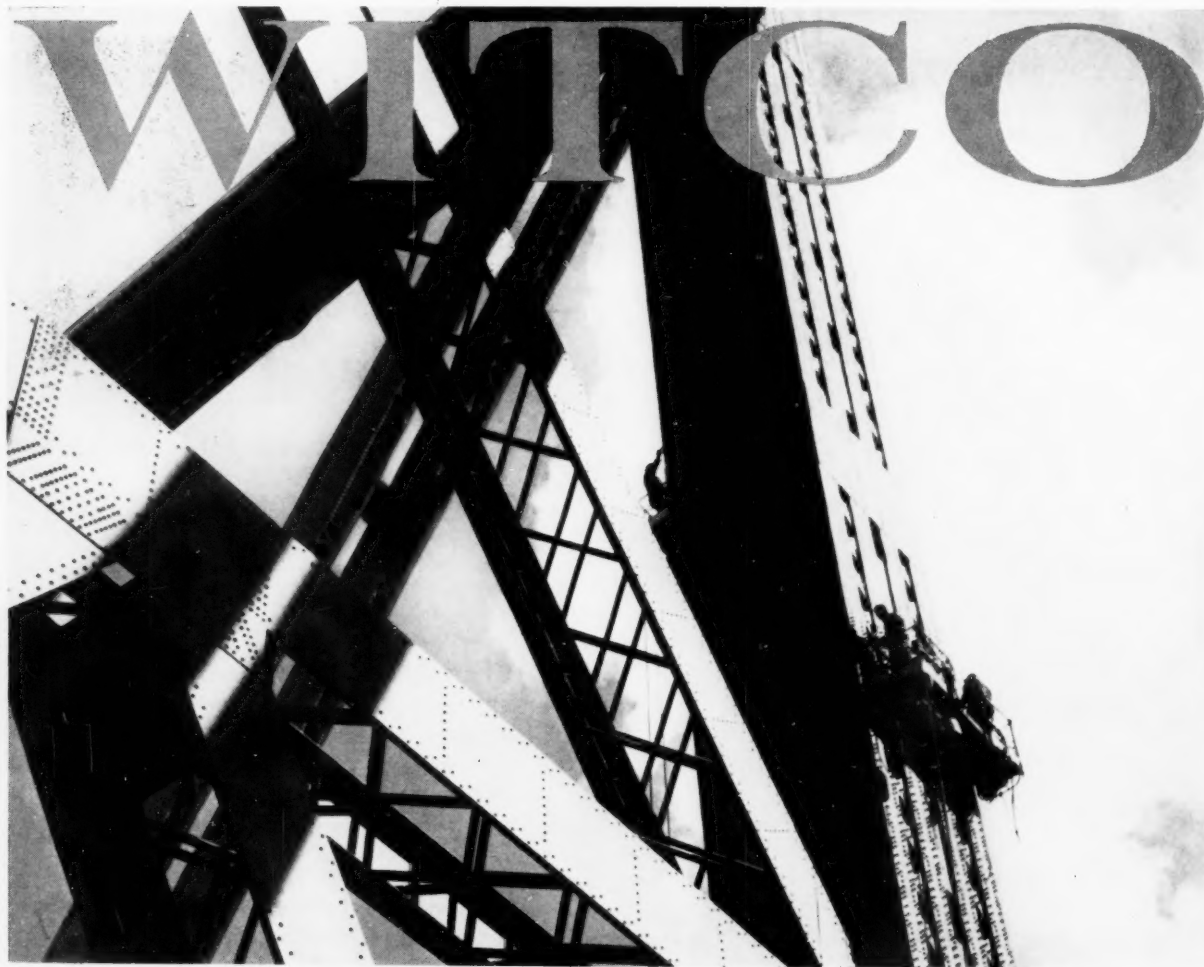
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# Using Salt Efficiently

by INTERNATIONAL SALT COMPANY, INC.



## How to Measure Brine Strength on Different Hydrometer Scales

The most common method of measuring brine strength in industry is to use some type of hydrometer. Every hydrometer sinks into a liquid until it has displaced a weight of the liquid equal to its own weight. The scale divisions on a hydrometer are not usually of equal length, since the volume of displaced liquid increases as more of the stem is immersed.

Using a hydrometer is a relatively simple process—but reading the hydrometer scale is complicated by this fact: the scale may vary from plant to plant because hydrometers may be used to measure strength of other liquids, as well as salt brine. To help clear up any possible confusion, here are an explanation and a comparison of the five most common hydrometer scales used for measuring brine strength.

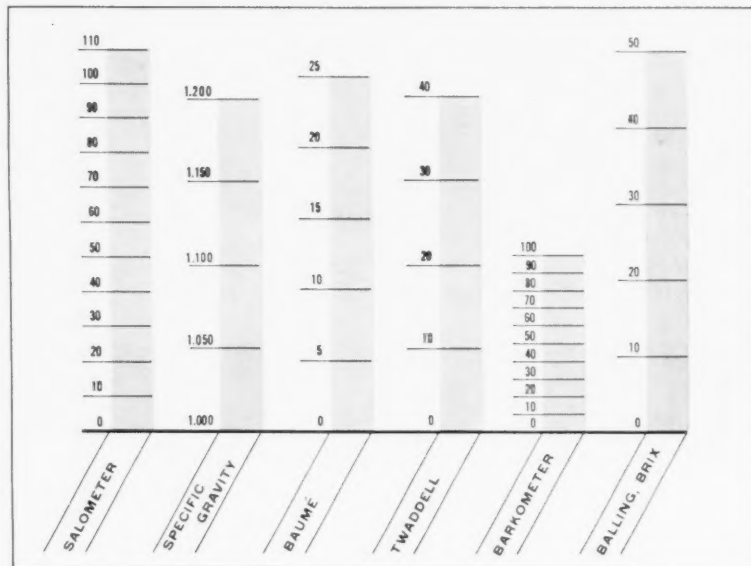
**SALOMETER SCALE.** This is by far the most common of all the hydrometer scales used for testing brines. The scale indicates directly the per cent saturation of the brine, reading 0° S. in pure water, and 100° S. in fully saturated brine. The salometer uses the values of Gerlach, meaning that 100%-saturated brine contains 26.395% salt by weight. Each salometer degree, then, represents 0.2639% salt.

The salometer reading expresses the per cent of saturation. Thus, a brine of 40° S. strength is 40% saturated, and contains 40% of 26.395%, or 10.558% salt by weight.

**SPECIFIC GRAVITY SCALE.** This reads the specific gravity of the brine directly. These hydrometers may be obtained with the entire length of scale covering a limited range of specific gravities, thus permitting great accuracy.

**BAUMÉ SCALE.** This scale was originally intended to have each degree equal a per cent of salt in the brine. But this is now only a rough approximation. The Baumé scale reads 0° BÉ. in pure water, 24.6° BÉ. in fully saturated brine. Also, a factor of "modulus" is needed to translate degrees BÉ. to specific gravity, since the scale divisions are of equal length. This modulus has been standardized at 145, so that degrees BÉ.=145/sp.gr.

**TWADDELL SCALE.** Named after its inventor, the Twaddell scale reads 0° Tw. in pure water, 40.8° Tw. in fully saturated brine. Each increase of 0.005 in specific gravity causes 1° increase on the Twaddell scale. Thus, the



COMPARISON OF COMMON HYDROMETER SCALES

(Chart gives quick, visual relationships of readings on the salometer scale to readings on other scales.)

number on the right of the decimal point of the specific gravity, divided by 5, is the degrees Tw. For example: 1.140 sp.gr. is 140/5, or 28° Tw.

**BARKOMETER SCALE.** Used extensively for testing tanning liquors, the Barkometer scale reads 0° Bk. in distilled water, and 204° Bk. in fully saturated brine. Each increase of 0.001 in specific gravity causes 1° increase on the Barkometer scale. Thus, the number on the right of the decimal point of the specific gravity is the degree Bk. For example, 1.025 sp.gr. is 25° Bk.

The hydrometer scales described above are usually calibrated for brines at 60°F. temperature. When testing brines at other temperatures, it's necessary to make certain corrections... or to use a specially designed hydrometer. You can get a table

showing proper temperature corrections, plus other data on measuring brine strength, from International Salt Company.

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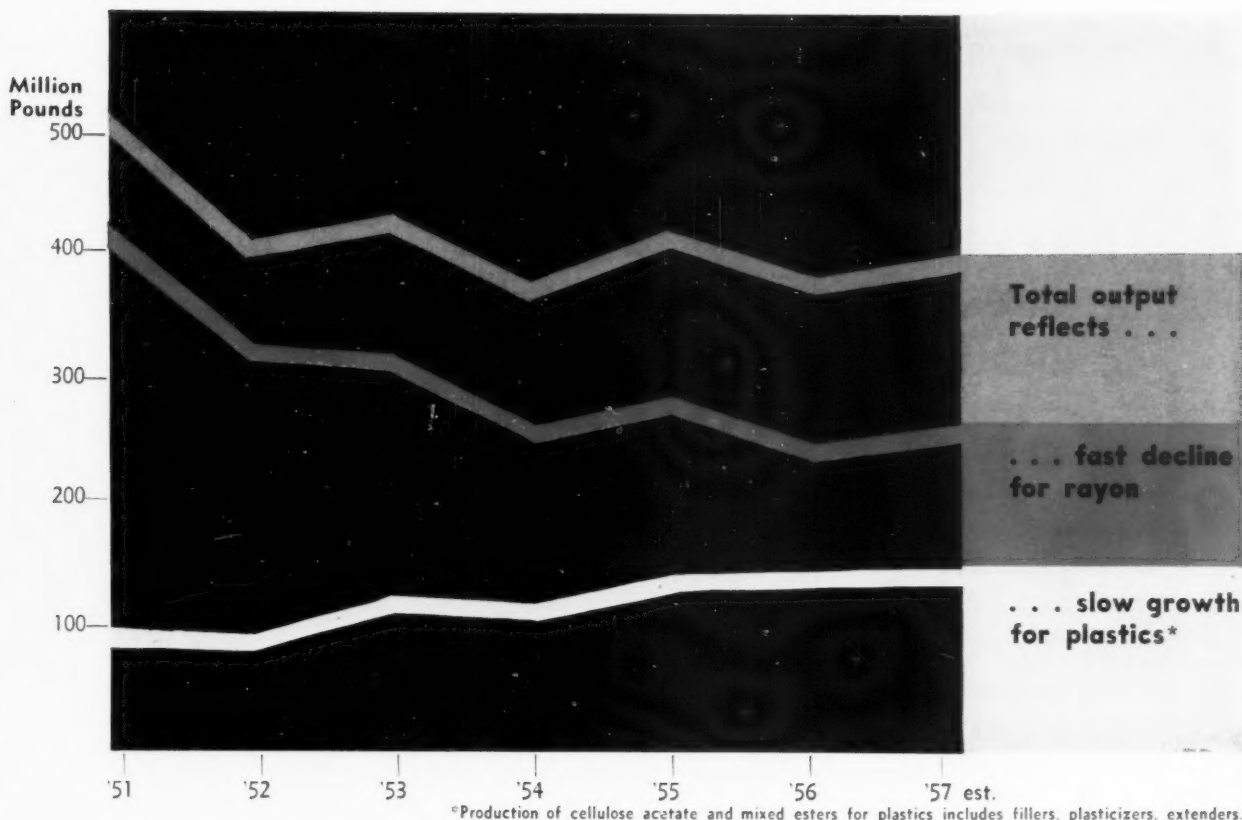
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# MARKETS

## U. S. Cellulose Acetate Production



## Cellulose Acetate Outlook: Bright or Bleak?

Confusion rippling through trade circles in the wake of Hercules Powder's announced intention of quitting the cellulose acetate business (CW Market Newsletter, Feb. 8) can be attributed largely to two causes: consumer worries about adequate supplies, and inference by some that the Hercules action has, in effect, slapped a "sick and dying" label on the entire cellulose acetate industry.

On the contrary, there's no real reason to fear that cellulose acetate supplies will become tight; and the industry certainly isn't on the verge of collapse—though just how good it looks to each producer depends on his particular position in relation to the various consuming industries.

To Hercules, the cellulose acetate business obviously looks bad—for two main reasons. The major part of the

firm's acetate output has been going into manufacture of acetate rayon, a steadily declining market (see cut p. 47); and the company has been at a disadvantage, compared with other producers, because of lack of captive uses. These handicaps, especially when weighed against more promising ventures such as polyolefins, make Hercules' move understandable.

**Shortages Unlikely:** Elimination of a long-time producer of any commodity, of course, prompts the question of future supply/demand balance. Here are some of the reasons why Hercules' withdrawal will not leave any consumer strapped for supplies of cellulose acetate: Hercules' total acetate capacity (now about 40 million lbs./year) is relatively small; hence, its elimination will be felt less than if one of the larger producers had

stepped out. Moreover, the acetate industry has been operating at considerably less than full capacity—estimated now at 60-78%; hence, other producers could step up output to fill the gap left by Hercules' exit. And to help allay troubles, Hercules will taper off its acetate operations slowly enough to permit its customers to find new sources without hardship (they have until early '59 to make the adjustment).

Also, if textile requirements for acetate continue to fall off as in past years, more acetate productive capacity will be available to more than meet demand from increasing plastics uses. The textile picture now, however, is somewhat obscure. Some cellulose acetate textile products have been discontinued, but others are being promoted in the hope that continued

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## MARKETS

encroachment of noncellulosic synthetics will be slowed (*CW Report*, March 8, p. 93).

**Enough Capacity?** What's the total U.S. cellulose acetate capacity today? It's moot. Though producers admit that "others" in the industry probably have shaved acetate capacity in the past few years, no one will say officially that his own company has been involved in cutbacks.

Case in point is Eastman's acetate capacity, estimated in '52 at 200 million lbs./year. Some market observers say it's now 100 million lbs./year, but Eastman, without naming specific capacity figures, says it "certainly has not reduced production."

Giant of them all, Celanese, probably has not cut output, can produce at least 257.5 million lbs./year; Du Pont may have slipped a little, to 50 million lbs./year; Hercules is figured at 40 million lbs./year right now; and American Viscose, 18.5 million lbs. a year.

Assuming that the lowest capacity figures cited are approximately correct, current U.S. acetate capacity adds up to about 466 million lbs./year. This is more than 100 million lbs. less than estimated for '52. And capacity would presumably drop to some 426 million lbs./year when Hercules is out.

How does this "minimum" total capacity compare with current acetate requirements? Total U.S. acetate demand in '57 amounted to 395 million lbs., of which 257 million lbs. went into textiles, 138 million into plastics.

Textile demand in the next year or two might decrease, at best may increase only moderately (as it did in '57). For the past few years, the textile market for acetate has roller-coasted from a high of 420 million lbs. in '51 to a low of 245 million lbs. in '56. A small increase was noted in '55 and again in '57, but so far these appear to have been of little significance.

**Long Way to Grow:** The plastics side of the picture has been brighter, but even a massive increase in plastics' total acetate consumption would leave it considerably less than that of the textile industry. Growth of plastics demand for acetate has been fairly steady, but not spectacular, and, in the past two years, has shown definite signs of leveling off. That would appear significant to Hercules, but apparently is of relatively little concern

to more optimistic producers.

Even conceding the more optimistic outlook—that acetate will find increasing markets in plastics—it's still unlikely that the growth would in any sense resemble a boom.

Together, a decline in textile requirements and a moderate growth in plastics uses leaves a fairly sizable margin between total cellulose acetate demand and estimated available capacity—a comfortable situation for acetate buyers.

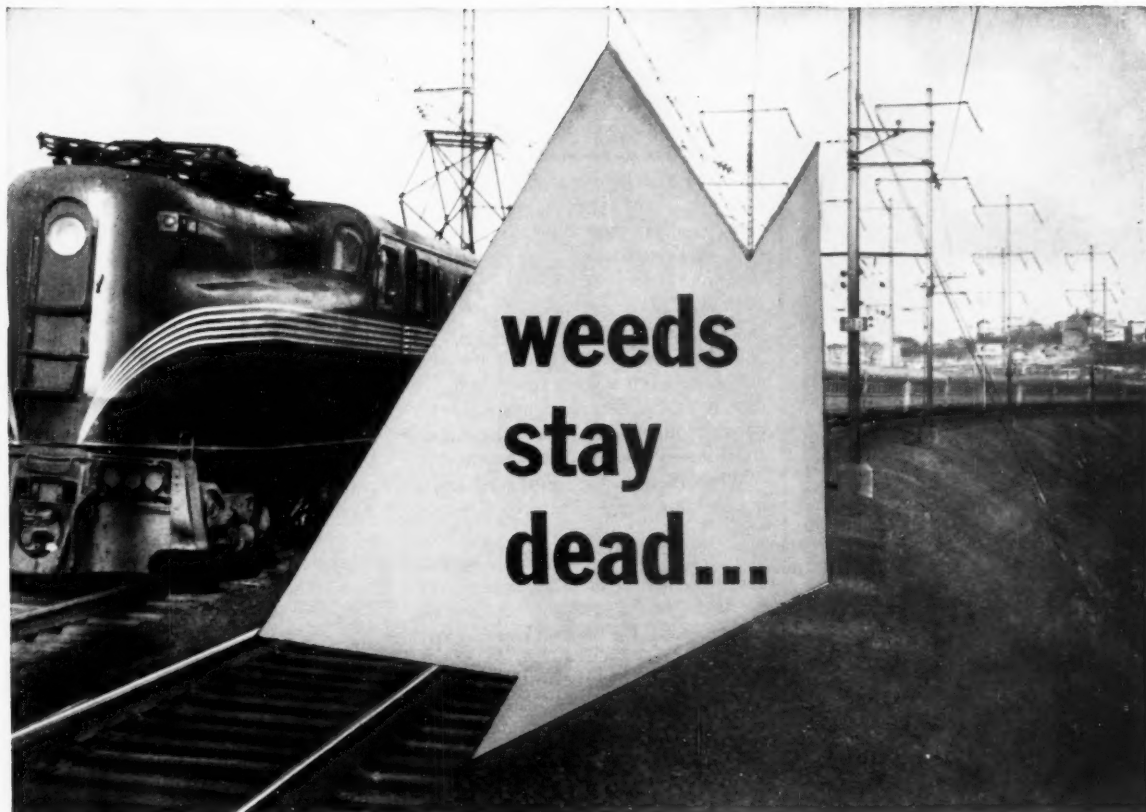
It's even highly unlikely that remaining acetate makers will have to hike capacity to take over the business dropped by Hercules. But some changes in manufacturing methods, says one producer, will be required. His firm, for example, will have to make new grades of acetate with specifications (e.g., densities, viscosities) to satisfy Hercules' customers.

**Plastics Patterns:** Ten years ago, when total U.S. production of cellulose acetate amounted to a little more than 432 million lbs./year, 12.7% (54.8 million lbs. in '48), went into plastics uses. Today, plastics take almost 35% (138 million lbs.) of the total acetate production (395 million lbs. in '57).

In the flux of shifting market patterns, an accurate end-use breakdown of cellulose acetate plastics is hard to come by. And the market picture is further complicated because mixed esters, notably cellulose acetate butyrate, cannot be separated from acetate *per se*. The unavoidable inclusion of mixed esters, incidentally, may go far in explaining why Eastman, heavy in emphasis on the mixed esters, views the cellulose acetate plastics outlook with optimism while Hercules doesn't.

General trends in cellulose plastics markets are obvious. A decade ago, the top items in cellulose plastics were toys and novelties, which then accounted for about 20% (10.9 million lbs.) of the acetate's use in plastic application. The remaining 80% went into continuous extrusion and manufacture of personal items (beads, etc.), 15% (8.2 million lbs.) each; hardware, industrial, household and miscellaneous uses, 10% (5.5 million lbs.) each; communication and transportation, 5% (2.7 million lbs.) each.

Since then, radical changes have occurred. Use in toys and novelties, for example, has virtually disappeared. Dolls, once made entirely of acetate,



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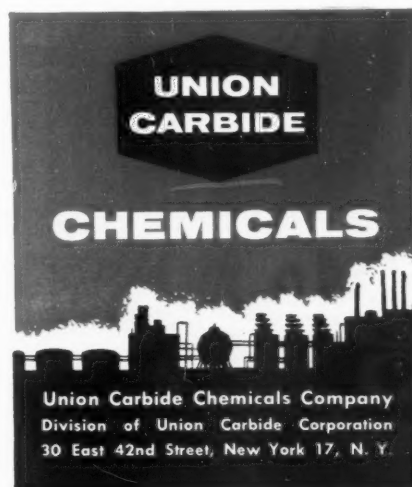
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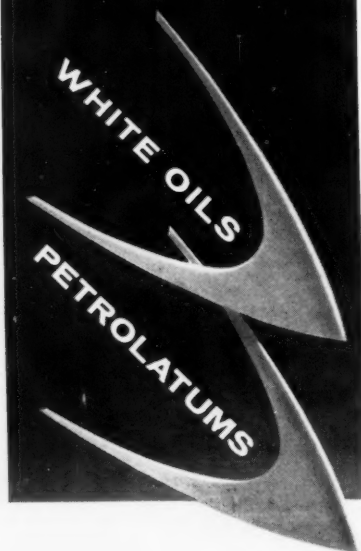
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## MARKETS

are now made of vinyls. Many novelties, hobby kits, etc., are now formed from polystyrene.

At one time, as much as 6 million lbs./year of cellulose acetate went into manufacture of beads—a market since lost to polystyrene and, to some extent, polyethylene. (Some trade observers now report that cellulose acetate is regaining some of the bead market lost to polyethylene.)

More recently, relatively secure cellulose acetate markets such as film for packaging and magnetic recording tape have felt competition from newer materials, notably Mylar.

What then is the source of some industry optimism about this cellulose plastic? Considerable hope is put into one new outlet—shoe heels—which opened up about three years ago, now takes 4-5 million lbs./year of acetate and butyrate. This is considerably short of the 7-million-lbs./year market expected by '58. Nonetheless, the industry is confident it will attain the 10-million-lbs./year goal set for '60.

Also promising are automotive applications of acetate butyrate, especially for stop light and directional signal light lenses.

And there will be a big attempt to promote acetate butyrate in manufacture of vacuum-formed outdoor signs (butyrate will dominate here because of its superior weathering properties). It's a potentially big market, but it will have to be wrested from acrylics, which heretofore have dominated the outdoor sign business.

Anticipating new markets such as these, an Eastman spokesman recently reiterated his faith in the future of celluloses. These materials, he said, "have established themselves in a virtually impregnable position in certain fields of use." He added that as recently as last summer demand for Eastman's acetate and butyrate was so heavy that "we were almost obliged to fill orders on allocation."

**Molded Market:** Although cellulose acetate use in sheets, tubes and rods has in recent years contributed to the over-all growth of cellulose acetate plastics, total acetate consumption in plastics more nearly parallels the growth trends of sales of acetate for use in molding and extrusion.

More than two-thirds of all cellulose acetate (and mixed esters) sold annually for use in plastic products has been for molding and extrusion. Ex-

cept for a slight drop in '54, sales have increased each year, made the biggest jump in '55, when 90.1 million lbs. were sold for those purposes, compared with 75.5 million lbs. in '54. As a result, acetate sales jumped similarly, from 111 million lbs. in '54 to a near 131.4 million in '55. In '57, sales for plastics reached an estimated 138 million lbs., of which some 95.3 million lbs. went into molding and extrusion uses.

This year will be mainly a period of readjustment for the cellulose acetate business. Some buyers will look for new suppliers and manufacturers will be busy revamping plant facilities to meet the special needs of new customers.

Aside from that, little change in total U.S. production of cellulose acetate is foreseen for the near future. And the *status quo* will persist as long as changes in textile demands for acetate are offset by changes in the plastics end of the business.

## Fertilizer Forecast

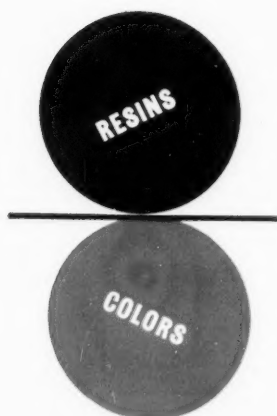
The U.S. fertilizer industry "appears somewhat more optimistic than it was a year ago," reports the **Business & Defense Services Administration of the U.S. Dept. of Commerce.**

Although fertilizer demand during the early part of '56-'57 (year ending June 30) was disappointing, late-spring shipments were heavier than anticipated.

As the result of reduced postseason carryovers in June '57, production in the summer and fall exceeded that in the corresponding period of the preceding year. The higher level of output may well carry over into '58. And practice of late buying, says BDSA, may be even more pronounced this spring.

A 5% increase in ammonia output in '58 is probable, says the agency, and producers will be able to continue operating at 80% of capacity. Urea production—about 20% higher in '57 than in '56—could be upped another 30% in '58, but demand "may not expand that rapidly." There's little prospect of an upturn in production of normal superphosphate, but output of other phosphatics will increase 1 to 2% in '58. A small increase in production and deliveries of potash is expected—in line with those for nitrogen and phosphorus materials.





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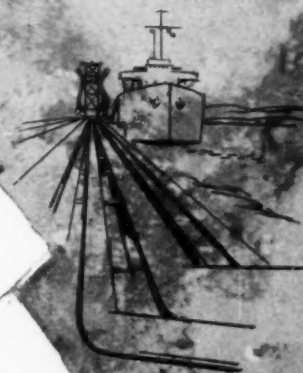
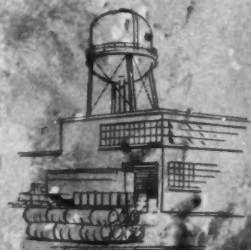


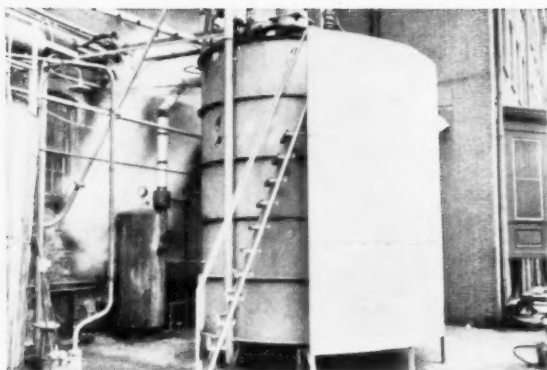
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# COMBAT CORROSION



**1** **Coated and uncoated oil pipe.** The top section of this 4-inch steel tubing was left uncoated; the bottom given a finish based on BAKELITE Brand Vinyl Resins. They carried the same 100 barrels of crude oil and 1000 barrels of high-iodine-content salt water every day for five months. The coated section shows no measurable damage.





**2** **BAKELITE Brand Vinyl Resins** are used in a coatings system that has lasted for three years at this chemical plant—far longer than other finishes. Equipment is in contact with caustics, alcohol, nitric, hydrochloric, and sulfuric acids, and ammonia. These coatings are now standard throughout the plant.



**3** **BAKELITE Brand Phenolic Resins** are the base for the baked-on interior finish of this tank. A coating based on BAKELITE Brand Vinyl Resin covers the outside. The tank is used to store propionaldehyde and is one of the largest with a baked phenolic-based inside coating, protecting both contents and tank walls.

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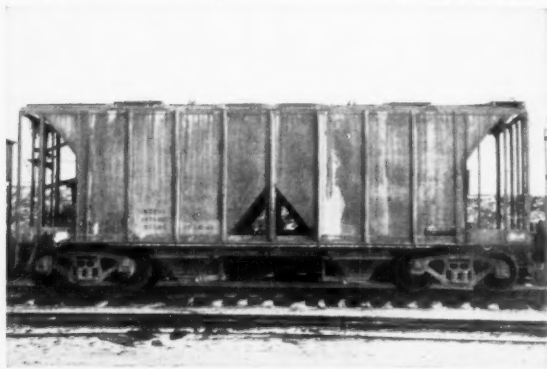
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**4** **BAKELITE Brand Vinyl Resins** form the basis for coatings used on this hopper car. It has been constantly exposed to cargoes of soda ash, cement, mineral calcium fluoride. Sledge-hammer blows to loosen the cargo dented the metal sides. But the coating held fast for eight years, needed only occasional washing.

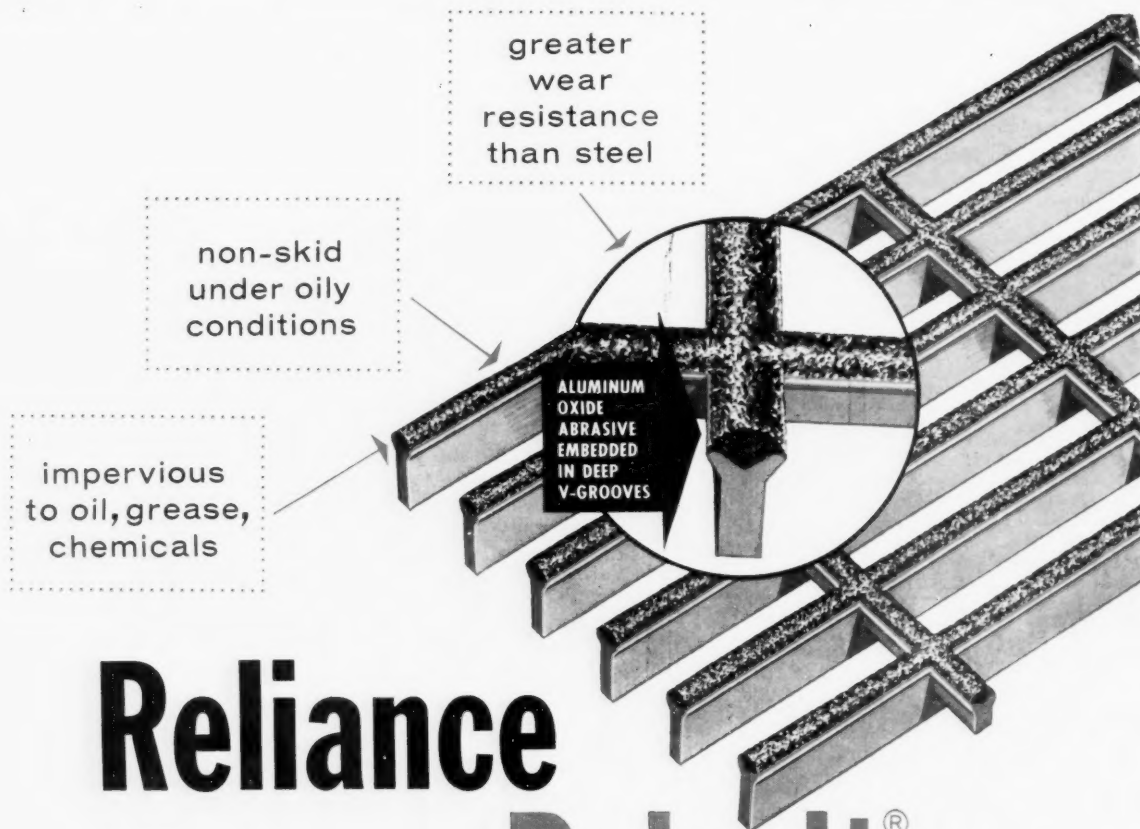
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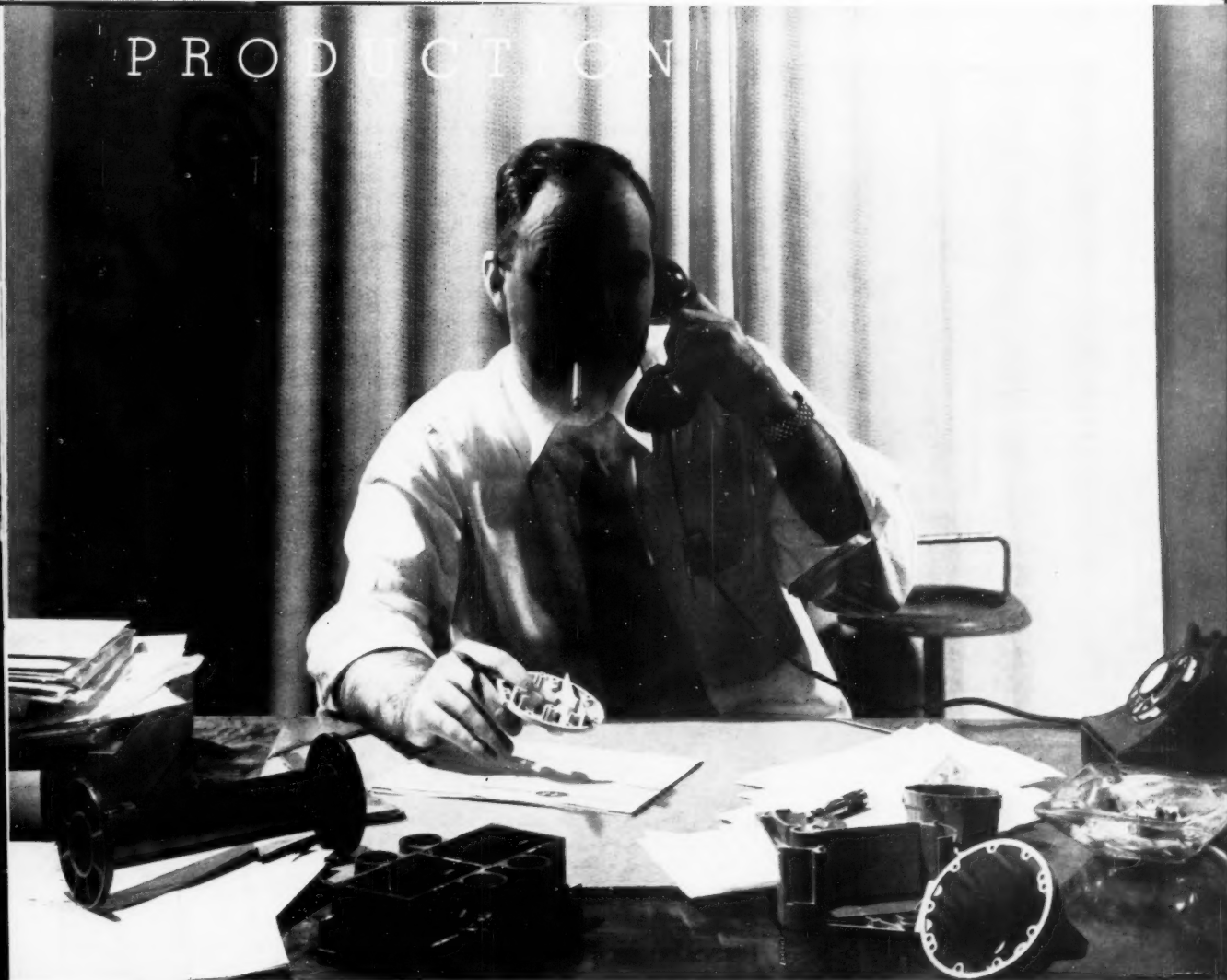
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CW PHOTO: BYD KARDEN

Busy maintenance supervisor's stake in production grows with complexity of modern processing.

## Will Maintenance Manage Future Plants?

"If I had to pick my successor right now," said a West Coast chemical plant manager last week, "I'd give our maintenance supervisor serious consideration for the job. We've already reached the stage where a good production manager has to be a good maintenance man. If he isn't, he will find himself 'operating' a plant that isn't operating."

Behind this statement: a changing pattern of plant operations. With the increase in process complexity and number of automated plants, production departments are counting more heavily than ever before on maintenance for continuity of production and payoff of increased plant investment.

Yet, few plant managers are ready to concede the apparently logical next

step—grooming a maintenance man for the plant manager job. They are convinced that the best route to plant manager is through production experience. And many plant engineers agree.

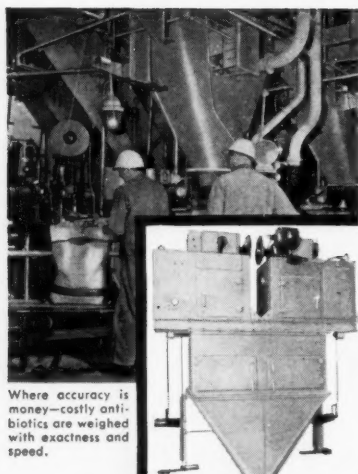
As one vice-president in charge of plant operations sums it up: "When you look for a new plant manager, you look for a man with certain capabilities. In the case of most chemical plants, this means a man with a chemical engineering background. The chemical engineer's background is well rounded—he knows the production end, and since he is an engineer, he naturally knows a lot about maintenance."

"You rarely find a maintenance supervisor or plant chief engineer with a chemical education. He just doesn't

know much about production operations, so he's of more service where he is."

A general manager of a Gulf Coast chemical plant states the case more adamantly: "Maintenance people are just not interested in process operation. In fact, it's hard to get them to learn operations beyond the knowledge they must have to carry on maintenance activities properly."

Another plant manager adds: "In some plants, the engineering departments don't even report directly to the plant manager. Instead, they report to the company's central engineering department at the home office. So, it's even more difficult for these plant engineers, in spite of their broad maintenance background, to be-



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## PRODUCTION

come interested in production operations."

**Breaking Tradition:** Yet, one firm is already breaking with this traditional view. It has taken a bold step, is now taking engineers with three to five years of maintenance experience and placing them as plant managers. It reasons that these men are best qualified to determine whether equipment will last another two days—or whether it will last two months.

"Some production managers can't appreciate that there is a right time and a wrong time to repair or replace equipment—and this time is not necessarily based on production schedules," says one maintenance engineer.

"Sometimes you can save money in the long run by shutting down for maintenance immediately, even though you could continue running until the production schedule calls for a shutdown. It's the old case of a stitch in time saving nine," he says.

**One Group Different:** Another indication that all plant maintenance men are not interested in maintenance alone is found in the fastest-growing plant group today—the instrument men. Because of the relative newness of the field, it is the first one suspected when there are process problems. As a result, some firms insist that instrument men know process technology so they may properly defend the process instrumentation. And their insistence has paid off so well in some plants that instrument engineers are often called in for consultation during study of new process ideas.

**More Maintenance Men:** But even with most plant managers continuing to gain their training in production operations, it is certain that they'll gain greater maintenance experience in the future through contact alone.

The average chemical plant has assigned more than 20% of its staff to maintenance—highest of any of the industries included in *Factory Management & Maintenance's* 226-plant survey last year (*CW*, Oct. 26, '57, p. 49).

And in many chemical plants, maintenance personnel already outnumber production personnel. For example, about 70% of one new New England plant's staff is made up of maintenance employees. A Midwest ammonia plant's maintenance staff is 20% larger than its production staff. More than 53% of a Gulf Coast heavy

chemicals plant's production and maintenance staff is assigned to maintenance; at another plant, 50%.

Many petroleum refineries have long employed more maintenance men than production men. And a similar situation exists at many petrochemical plants.

Du Pont has reported that maintenance wage rolls have increased 125% while the total plant wage roll has climbed only 50% since 1940 (*CW*, June 29, '57, p. 65). And the firm's Engineering Service Division pinpointed a major reason: as individual units are added to a process system, the effectiveness of maintenance on the individual units must increase.

If the trend toward greater complexity and automation of processes continues, it's certain that chemical firms of the future must either teach top maintenance personnel chemical technology, or intensify potential plant managers' training in maintenance.



UNITED PRESS

## Girl in the Plastic Mask

**Face masks** are usually worn for protection, but this University of California coed has volunteered to wear hers as part of a study of atmosphere at the university's Riverside campus. Smog will be pumped into the mask, which assures that the pollutant will be in constant contact with the skin. The smog will also be applied to vegetation to determine whether eye irritation and crop damage result from the same chemical combinations.

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## PRODUCTION

## EQUIPMENT

**Fused Quartz:** Amersil Quartz Division of Engelhard Industries, Inc. (Hillside, N.J.), is now custom forging fused-quartz blanks. Previously available in standard cylindrical ingots, the specially shaped forgings, Amersil says, will save users up to 95% on their present waste.

**Instrument Repair Service:** Fast, efficient instrument repair according to customer specifications is the theme of Leeds & Northrup Co.'s (Philadelphia) new four-echelon factory repair service. L&N says instruments are normally returned to customers within two weeks. The customer specifies whether the repair is to be Type 1 (for inoperative instruments requiring emergency repair only), Type 2 (for instruments of electrical character—does not include replacement of operable, though worn, mechanical parts), Type 3 (for mechanical instruments), Type 4 (for "like new" repairs).

**New Valves:** Four firms have made recent additions to their regular valve lines:

- Skinner Electric Valve Division (New Britain, Conn.) has added a two-way solenoid valve that combines large-orifice capacity and high-pressure differential. Called R Series, the valves have a 1/4-in. orifice, are for 5- to 200-psi. service (1,000 psi. and higher ratings will soon be available). Internal parts are of stainless steel. Connections are for 1/4-in. pipe threads.

- Sinclair-Collins Valve Co. (Akron, O.) offers a lever-operated valve for 1,000-psi. service for raw, cold water, oil- and glycol-base fluids. Valves are available in three- and four-way types; all ports are closed in a neutral position. Connections are for 1/2-in. pipe threads.

- Hoke, Inc. (Englewood, N.J.), has added a 570 Series of piston-type check valves to its line of ball-type check valves. Brass valves operate at 3,000 psi.; Type 303 stainless steel valves operate at 5,000 psi. Valves are for liquid and gas service, have connections for 1/8- to 1/2-in. pipe threads.

- Scovill Mfg. Co., Inc.'s A. Schrader's Son Division offers a new series of 3- and 4-way poppet-type valves for use on air controls. Valves are available with roller, solid-angle, hand and hand-lockdown levers, have a 70-cfm. air-flow capacity. Connections are for 1/4-in. pipe threads.

**Thermoswitches:** Two new Thermoswitches for providing temperature control in corrosive, high-temperature atmospheres replace limited-range units in Fenwal Inc.'s (Ashland, Mass.) temperature-control line. The units have a temperature range of -100 to 600 F, can withstand short-time thermal overshoot of 100 F. Made of Type 316 stainless steel, they are resistant to most common chemicals. Model 18003-7's contacts close

on increasing temperature; Model 18002-21's contacts close on decreasing temperature.

**Explosionproof Switch:** LeLacheur Corp.'s newly designed Intrinsitrol, electrical switching device, available from Brookdale Engineering & Services Co. (Boston), may be used with any general-purpose switch having exposed contacts and will still operate safely in hazardous locations (Class I, all groups). The device has a plug-in, 7- x 12- x 6 1/2-in. chassis, will operate at switching-control distances up to 1,000 ft.

**Hammer-in Tool:** Ramset Fastening System of Olin Mathieson Chemical Corp. (Cleveland) is out with a new multipurpose tool that can be used for manual drilling and hammer-in fastening to materials such as concrete, cinder block and mortar. Called R-360, it combines a masonry drill-holder and Ramset's Shure-Set hammer-in tool.

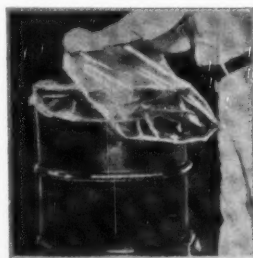
**Centrifugal Pump:** A 1-in. suction, 3/4-in. discharge, stainless-steel centrifugal pump has been added to Ampco Metal, Inc.'s (Milwaukee), pump line. Because of its small capacity and moderately high (100 ft.) head, Ampco suggests it for pilot-plant service.

**Miniature Meter:** Where weight or control-board panel space is at a premium, International Instruments Inc. (New Haven, Conn.) offers its new Model 173 as a meter that does not sacrifice readability, dependability and sensitivity. Scales and ranges are supplied to suit the application. The meter is 1 1/2 in. wide, has a 3.4-in. circular scale equivalent to a 4 1/2-in. scale length on a conventional-type meter. Model 173 has an accuracy of  $\pm 3\%$  of full scale, weighs 6 oz.

**Plug-Valve Actuator:** Research Engineering Co. (Houston) is out with a new, rugged, compact actuator that can be placed over, and adapted to, the average wrench-operated plug valve in a few minutes. The actuator, called Robotarm Valve Actuator, can be gas- or fluid operated, is suitable for other mechanisms that rotate 90 degrees.

**System Monitor:** Panalarm Division of Panellit, Inc. (Skokie, Ill.), is out with a new annunciator for monitoring complex automatic systems, particularly where interlocks or automatic shutdown are involved. It reports off-normal conditions on an instrument-type panel, both visually and audibly. Controls—static-magnetic rather than the precision-relay type—have no moving parts. Plug-in design makes it possible to change sequences without rewiring, and to expand the system easily. The device's elements are capable of four logic functions—"and," "not," "or" and "memory." Previous state is "remembered" after power failure.

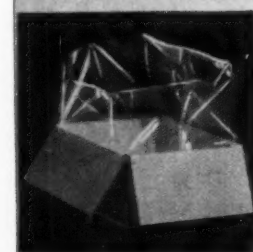




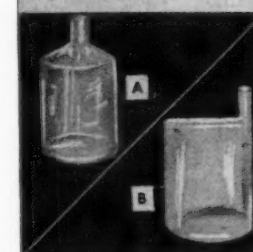
Peel-Over



"All-Chem" Spout\*



Carton Liners



(A) Conical-Sleeve Spout  
(B) Flat-Sleeve Spout



"TWIN-SURE"  
DOUBLE-SEAL

Manufacturer of the  
famous "TWIN-SURE"  
DOUBLE-SEAL  
Leak-proof Liners



Tie-Off

## PROTECTIVE'S SUCCESS!

The First and The Best

"POWER-SEAL"\*



FOR

DRUMS • CANS • PAILS

and SPECIALTIES

All Diameters • All Heights

**SCIENTIFICALLY** sealed **POLYETHYLENE**, Mylar, and Copolymer Vinyl—  
with guaranteed safety.

**PERFECTLY** made to insert easily and fit exactly all types of **ROUND**  
**CONTAINERS**.

**EFFICIENTLY** made for top tie-off; for peel-over with separate disc-top  
-cover; or with spouts, including our special **HEAVY DUTY**  
"ALL-CHEM" LINER for attachment to Rieke Flexspout.

**LOGICALLY** made to solve "square pegs in round holes" with simplified  
round-liners to fit **ROUND CONTAINERS—ECONOMICALLY**.

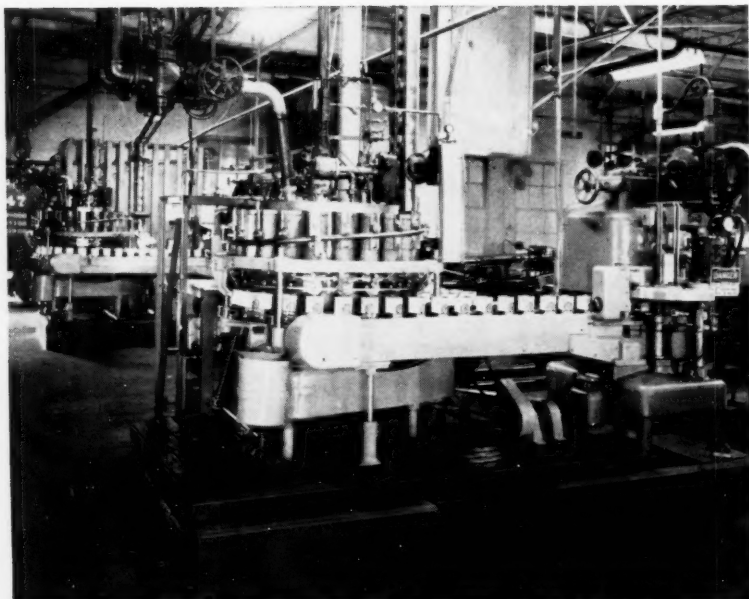
Write, wire, or 'phone us collect—for information and free samples.



# PROTECTIVE LINING CORPORATION

22 WOODHULL STREET, BROOKLYN 31, N. Y.

# PFAUDLER



425 quarts a minute filled on this 21-station lube filler at Texaco plant. A total of three

Pfaudler fillers handle all lube packaging requirements of the Port Arthur plant.

## Filling without spilling at Texaco to 99.9969% accuracy

Texaco uses just three machines at its Port Arthur plant to fill a complete line of motor oils, hydromatic fluids, and antifreeze in quarts and gallons.

Two of these machines—RPL-21 type Pfaudler piston fillers—fill 410 to 425 quarts a minute. They each hold another 65 quarts a minute in reserve capacity. They fill at any

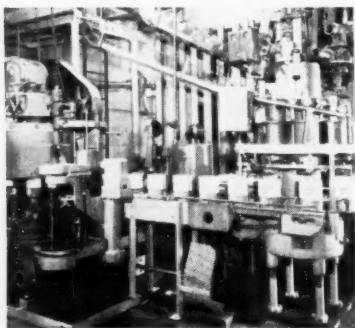
viscosity over the complete temperature range 80° to 105° F.

The third machine—an RPL-7 Pfaudler filler—handles gallons at 60 to 80 per minute.

All three machines are accurate to  $\pm 0.1$  ounce by liquid volume. They eliminate spillage completely . . . send cans from the plant with labels and cartons *clean*. No maintenance is required beyond routine cleaning.

There are only three primary wearing parts on these Pfaudler fillers: piston and valve rollers and valve trip cams. All are inexpensive and easy to replace. There are no connecting rods or wrist pins to cause trouble.

Simple, positive adjustments of the can support rails eliminate product spillage by compensating for the centrifugal forces generated during high-speed filling. An accelerating infeed screw pushes cans in uniformly without jamming.



Cleaning is easy, too. You empty the bowl through a drain port, flush with kerosene, put the machine through a few revolutions, and it's clean.

There's more information about the complete line of Pfaudler fillers offered in the coupon.

## New flush valve boasts one-piece glassed head and stem

When we took all the porcelain out of this bottom outlet flush valve, we eliminated a major cause of valve failure.



Head and stem are *one piece and glassed*. No cement. The seat is made of rigidized Teflon-glass fiber and its bevel mates with that of the spherical head. Rubbing the glassed head on the Teflon seat produces absolutely no static. The Teflon also has some "give" so you can get a firm seating without danger of cracking the head covering, a continual problem with the old porcelain designs.

We don't have to tell you of the positive and leakproof sealing you

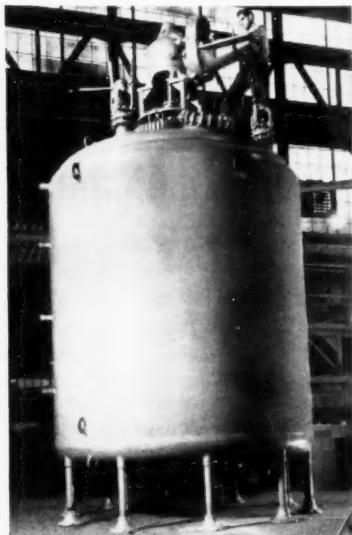
# CORROSIONENGINEERING NEWS

get with this ball-joint construction. And it's probably equally self-evident that the rounded, glassed head eliminates product build-up during processing.

So all there is left to tell is that the new design is interchangeable with existing valves you might now be using, and that the unit costs no more than a conventional stainless steel valve. Sizes range from 1½ by 1 to 8 by 6 in six different models.

Anything else you might want to know is covered in Data Sheet 42 which is offered in the coupon.

**This is the most** glassed-steel agitated reactor you've seen in one piece. O.D.: 120 inches. Height: 125 inches. Capacity: 7000 gallons. Material: glassed steel. It will be used to process monochloroacetic acid and alcohol at 158° F. The jacket is designed to take a 25 psi pressure at 350° F. This vessel uses a conventional three-blade impeller without a foot bearing. The agitator is set only 10 inches off bottom. *Moral:* We are ready to answer the most unusual process equipment requirements, and to glass any vessel from one-gallon lab units to giants like this. *For the record:* We've made vessels up to 35,000 gallon capacity for large volume storage and these are glassed, too!



## 130th Technical Course on maintenance and repair completed

Since we started our program of instructing maintenance and process men in the care and repair of glassed steel, more than 1800 men from more than 250 companies have graduated *cum laude*. The program started in 1941.

An interesting fact proves that these men and their companies have benefited from the instruction. Last year there was more than twice as much glassed-steel equipment in the field as in 1945. Yet we had far fewer units returned for factory repairs.

A goodly share of this improvement can be laid to the fact that

we have improved our glass over the years as well as the design of the equipment and accessories. But much of the improvement must still be attributed to more effective preventive maintenance in the field and to more effective repairs made right in customer plants by customer personnel.

If you have some new men you'd like to take the course, either here in Rochester or near your own plant, please let us know. You can start by writing for a copy of the program describing the course's subject matter.

Check the coupon.

**THE PFAUDLER CO.,** a division of PFAUDLER PERMUTIT INC.  
Dept. CW-38, Rochester 3, N. Y.



Please send information on ☐ Bltn. 878 RPL Oil Fillers; ☐ Bltn. 964 RPL-36 Oil Fillers; ☐ DS-42 Flush Outlet Valve; ☐ Maintenance Class Program; ☐ Bltn. 947 Buyer's Guide.

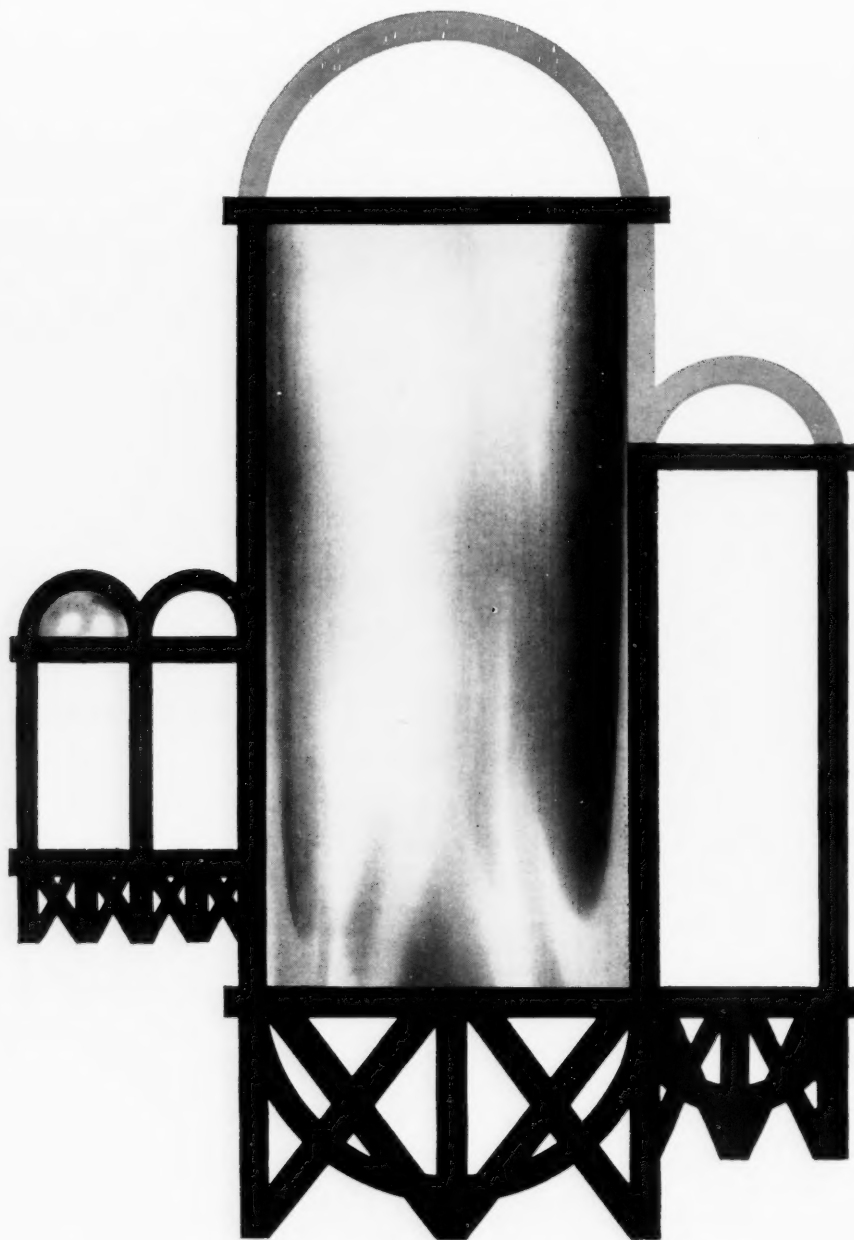
Name.....

Title.....

Company.....

Address.....

City..... Zone..... State.....



## win the fight against corrosion—with Alcoa Aluminum

Chances are the staggering cost of corrosion is your most serious headache. If so, don't overlook this important possibility: there is probably a known—and proved—economical aluminum answer to your most serious corrosion problem. Alcoa engineers can show it to you.

Alcoa's corrosion specialists have accumulated over 1000 man-years' experience applying aluminum to solve corrosion problems in the process industries. Their un-

equaled experience has produced an immense fund of factual data on the behavior of aluminum with corrosive materials and in corrosive atmospheres. That data is at your service.

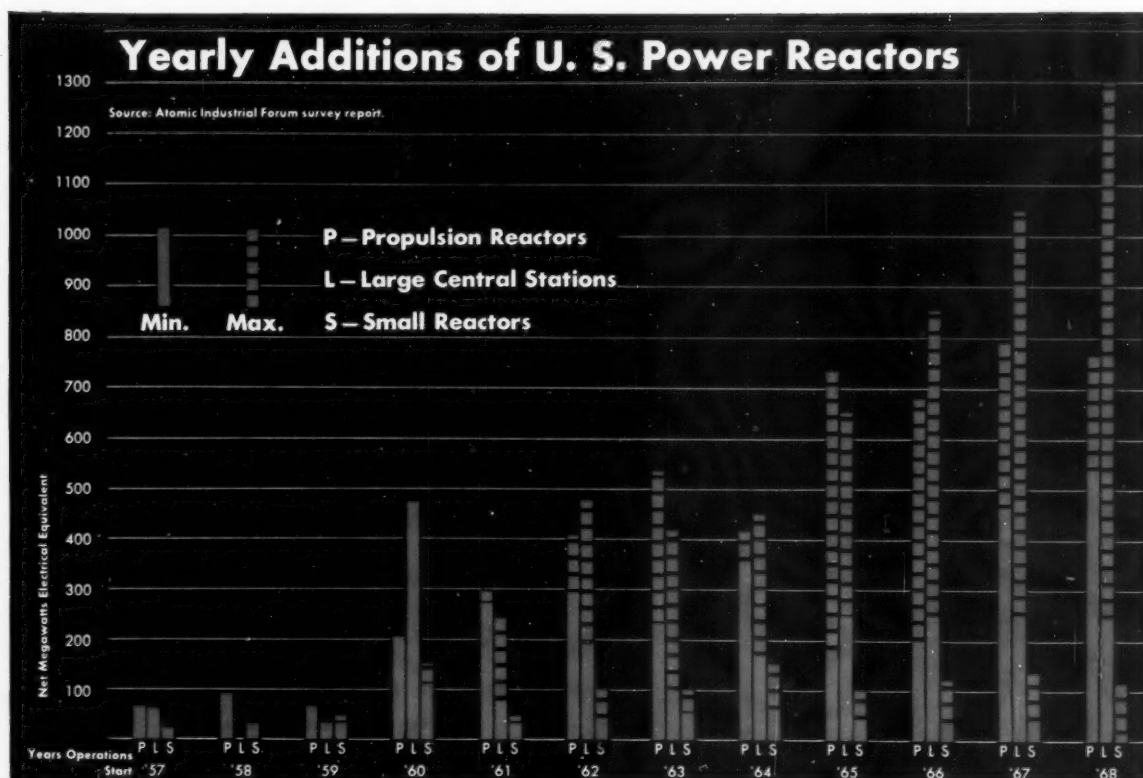
Let Alcoa's engineers show you how to *win the fight against corrosion—with Alcoa® Aluminum*. Outline your corrosion problems in a letter to ALUMINUM COMPANY OF AMERICA, 906-C Alcoa Building, Pittsburgh 19, Pa.

  
**"ALCOA THEATRE"**  
 Exciting Adventure  
 Alternate Monday Evenings



Specify Alcoa Aluminum for  
 corrosion-free Process Equipment  
 Pipe & Tube  
 Tanks, Containers, Trucks & Cars  
 Plant Structures





## New Look at Nuclear Power's Prospects

Though U.S. nuclear industry is still in the development stage, it is expected to have more than 500,000 kilowatts of electric power capacity installed by '60. Latest survey by Atomic Industrial Forum\* indicates that by the mid-'60s projected programs will present an annual market for \$30-140 million worth of fabricated uranium fuel, \$120-180 million worth of nuclear equipment.

As shown in the graph (above), there's a big difference between the minimum and maximum yearly additions of nuclear power plant capacity expected during the next decade. One of the chief reasons for this variation, says AIF, is that large station estimates are ultrasensitive to minor cost variations. For example, nuclear power cost that's only 1 mill/kwh. higher than the survey's minimum (12.8 mill/kwh.) could reduce by

### Power Reactor Fuel Requirements\* . . .

	for virgin natural uranium		for uranium as fabricated fuel	
	Initial reactor and processing inventory (Kg. mw.†)	Annual replacement (Kg./mw./year†)	Initial reactor inventory and spares (Kg./mw.†)	Annual replacement (Kg./mw./year†)
Large, natural uranium-graphite reactors	3,700	140	1,700	560
Large, natural uranium-heavy-water reactors	1,300	160	600	150
Large, slightly enriched, light-water reactors (1-3% enrichment)	2,000-2,300	170-200	200-300	180
Small, slightly enriched, water reactors (2-4% enrichment)	4,400	210	400	180
Large, low-enrichment propulsion reactors	n.a.	70	n.a.	50
Small propulsion reactors, highly enriched	n.a.	30	n.a.	0.5
Research and training reactors (90% enriched)	880/reactor	220/reactor	4 reactor	1 reactor

\*Typical requirements for important reactor types; assuming uranium in spent fuel will be recycled, virgin uranium only sufficient to make up U-235 burned.

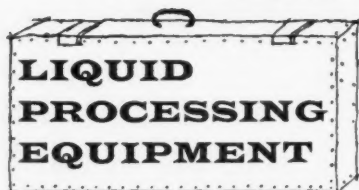
†mw. refers to net rated electrical power of the plant.

Source: Atomic Industrial Forum survey report.

\*"A Growth Survey of Atomic Industry 1958-68."

# COST CUT

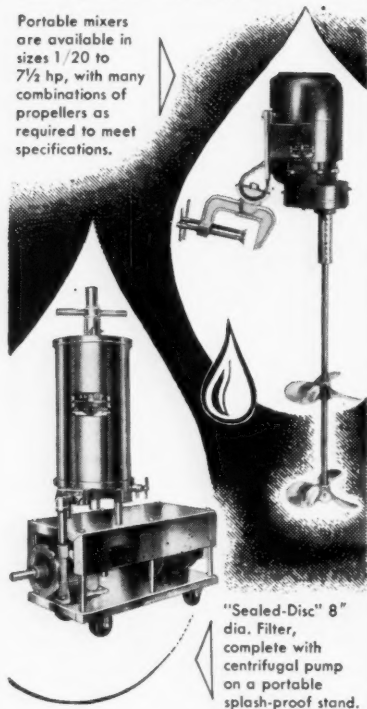
with *Portable*



Also light weight portable liquid processing equipment proves its cost savings daily in thousands of applications.

Easily moved from job to job, this versatile equipment eliminates the need for numerous, costly fixed installations. Now is the time to prove this in your plant!

Portable mixers are available in sizes 1/20 to 7 1/2 hp, with many combinations of propellers as required to meet specifications.



## DEPEND ON ADVICE FROM ALSOP

- Liquid Filtration
- Liquid Mixing
- Liquid Storage
- Liquid Pumping

## DEPEND ON EQUIPMENT FROM ALSOP

Send for literature and analysis forms.

**ALSOP**

ENGINEERING CORPORATION

1303 Twiss Street

Milldale, Connecticut

# ENGINEERING

nearly 50% the number of installations that could be run economically.

But the optimistic consensus reported by AIF is that costs will probably not be increased further. All of the projects currently under way exceeded original estimates because of unexpected technical problems, increased engineering required to produce unique nuclear components and a general price increase for both nuclear and conventional materials and equipment.

From here on in, it's expected that continued development and experience will yield cost reductions of 15-35% (in terms of '57 dollars) in the period 1960-68.

**Fuel a Big Factor:** The initial cost of operating with nuclear fuel (3.5-8.5 mills/kwh.) for large power plants now under construction, says AIF, should equal or exceed the cost

of using conventional fuels. But by the late '60s, it's hoped that improved burnup and lower fuel-fabricating costs will bring the portion of generating costs attributed to nuclear fuel down to the 3-5 mills/kwh. range.

During the period of the forecast, the United Kingdom and Europe are expected to be the largest consumers of freshly mined uranium. And if U.S. fabricators supply 5-20% of foreign reactor requirements, total annual dollar volume could run between \$20 million and \$100 million in the early '60s, \$30-140 million in the mid-'60s (see table, p. 63).

**Equipment Business:** Potential foreign sales of equipment depend largely on the types of reactor systems installed and on the competition from foreign suppliers. However, it's estimated that 20-30% of the installed value of U.S.-type plants in Europe

## Power Reactor Equipment Requirements . . .

. . . for propulsion reactors (P), large central stations (L) and small reactors (S)

Estimated delivered value of reactor components (million dollars year)

		1961		1964		1968	
		max.	min.	max.	min.	max.	min.
Fuel-handling equipment	P	—	—	—	—	—	—
	L	2.1	0.6	3.7	1.2	7.4	1.7
	S	0.4	0.4	2.3	0.8	1.6	0.3
Pressure vessels	P	9.0	8.2	10.8	8.8	19.7	13.9
	L	3.0	0.9	5.8	2.2	11.2	2.9
	S	1.0	0.9	5.9	2.5	4.1	0.7
Control apparatus	P	6.8	6.4	7.7	6.8	14.8	10.3
	L	2.1	0.8	3.4	1.3	6.3	1.7
	S	1.1	0.8	4.4	1.9	2.9	0.5
Heat exchanges or steam generators	P	11.3	10.3	14.4	12.4	23.1	16.0
	L	3.5	1.2	6.1	1.4	12.3	3.3
	S	1.7	1.0	6.5	2.7	4.1	0.7
Main pumps	P	10.0	9.2	12.7	10.7	19.5	13.6
	L	2.8	0.9	4.7	1.7	10.0	2.6
	S	0.7	0.4	2.6	1.1	1.5	0.3
Main piping	P	15.0	14.0	19.0	16.1	30.9	21.3
	L	2.3	0.8	4.0	1.5	8.7	2.2
	S	0.8	0.7	3.2	1.4	2.1	0.4
Main valves	P	8.0	7.4	10.1	8.8	16.3	11.0
	L	1.2	0.4	2.2	0.8	4.6	1.1
	S	0.8	0.7	3.2	1.4	2.1	0.4
Tanks and auxiliaries	P	11.9	10.9	16.5	14.1	24.8	17.0
	L	1.8	0.6	2.9	1.1	5.3	1.7
	S	0.8	0.5	3.1	1.3	1.9	0.3
Instrumentation	P	5.2	5.0	7.4	6.3	10.9	7.6
	L	1.6	0.6	2.8	1.1	6.4	1.6
	S	0.7	0.4	2.8	1.1	1.7	0.3
Waste-handling equipment	P	5.4	4.7	6.4	5.2	9.4	6.2
	L	1.6	0.5	2.7	1.0	5.5	1.6
	S	0.5	0.3	1.9	0.8	1.1	0.2

Source: Atomic Industrial Forum survey report.

# AMMONIA



## By the Push-button Process

Ammonia plant start-up operations are virtually a matter of "push-button" routine with Chemico; for Chemico has designed and constructed more than 50 ammonia plants in the last 40 years.

While new-comers to the field are constantly running into costly difficulties and delays with unreliable and even untried processes, Chemico designed plants are profitably producing an estimated 25% of the world's synthetic ammonia. Investors in the chemical industries may be interested to learn that despite the proven performance and countless advantages of Chemico's ammonia processes, it frequently costs less to build a Chemico Plant.

Write today for Chemico Bulletin #357 which lists the alternate feed stocks and methods for gas purification and production in the making of ammonia.

# CHEMICO

**CHEMICAL CONSTRUCTION CORPORATION**  
525 West 43rd Street, New York 36, New York

CHICAGO • DALLAS • HOUSTON • PORTLAND, ORE. • TORONTO • LONDON • PARIS • JOHANNESBURG • TOKYO

March 15, 1958 • Chemical Week

65

# MEMO:

**TO:**  
**UNION CARBIDE**  
**CHEMICALS COMPANY**  
30 East 42nd Street  
New York 17, New York

Gentlemen:

I have heard about the many and varied applications of Ucon fluids and lubricants. Please tell me how I can use them as:

- ☐ .....Hydraulic fluids
- ☐ .....Fire-resistant hydraulic fluids
- ☐ .....Gear lubricants
- ☐ .....High-temperature lubricants
- ☐ .....Low-temperature lubricants
- ☐ .....Rubber lubricants
- ☐ .....Packing lubricants
- ☐ .....Compressor and Pump lubricants
- ☐ .....Lift-truck lubricants
- ☐ .....Metal-working fluids
- ☐ .....Heat-transfer fluids
- ☐ .....Grease components
- ☐ .....Textile lubricants
- ☐ .....Defoamers and De-emulsifiers
- ☐ .....Cosmetic components
- ☐ .....Ink and dye diluents
- ☐ .....Leather softeners
- ☐ .....Solvents and Plasticizers
- ☐ .....Chemical intermediates

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

Specific requirements for the job I have in mind are:

**UNION CARBIDE**  
**CHEMICALS COMPANY**

DIVISION OF  CORPORATION

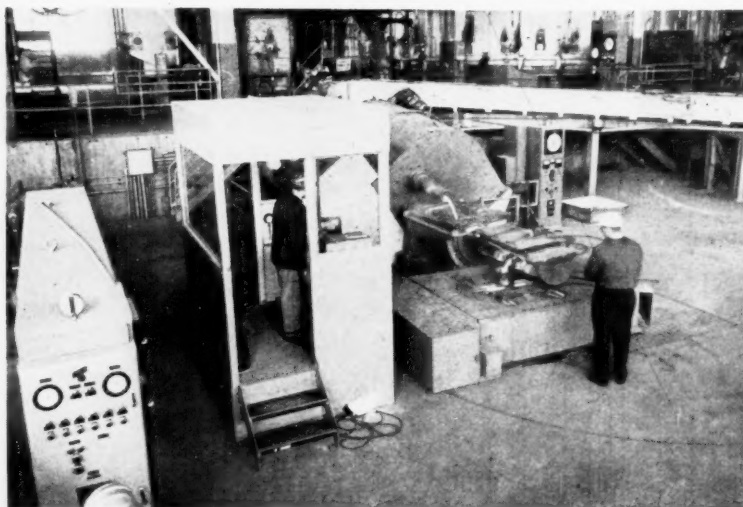
"Ucon" is a registered trade-mark of  
Union Carbide Corporation

## ENGINEERING

is available business for U.S. designers and producers—perhaps \$380 million.

And the annual equipment sales potential of the domestic nuclear power program is pegged at about \$300 million in '60; \$350-660 million by '68. As in AIF's '55 survey

(*CW*, June 11, '55 p. 44), naval, military and propulsion reactors (exclusive of aircraft nuclear propulsion systems) are expected to lead both large and small reactor plants in equipment requirements for the near future (see table p. 64).



From booth, operator controls continuous cake-casting unit electronically.

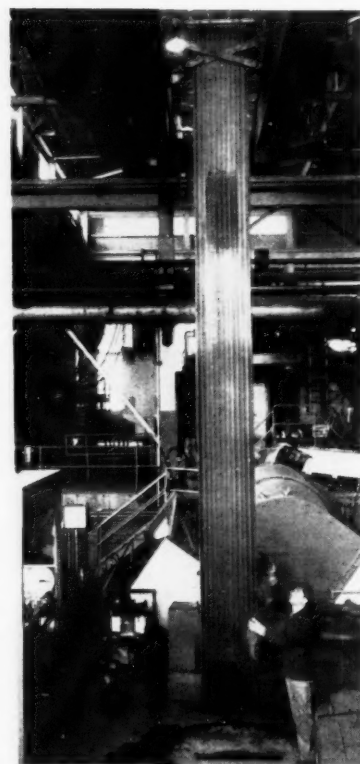
## Casting King-Size Copper Cakes

**American Smelting and Refining** last week displayed a unique continuous casting process used at its Perth Amboy, N.J., refinery. The process produces copper "cakes" up to 25 ft. long.

Key to the new multimillion-dollar cake-casting system: a bottomless, water-cooled mold that provides a heat dissipation rate of about 1,500 hp. Molten copper, supplied by Asarco's new continuous arc-melting furnace (*CW*, Jan. 25, p. 44), is cast at 2100 F. The metal solidifies as it passes through the 15-in.-deep mold at 20 in./minute (equivalent to 1,150 lbs./minute of a 5x36-in. cake).

As the cake leaves the bottom of the mold, it is supported by a hydraulic ram that lowers it through high-speed water-spray jets into a reservoir of cooling water.

The long cakes produced by continuous casting, says Asarco, will permit modern rolling mills to turn out more sheet and strip per hour at higher efficiency and lower cost.



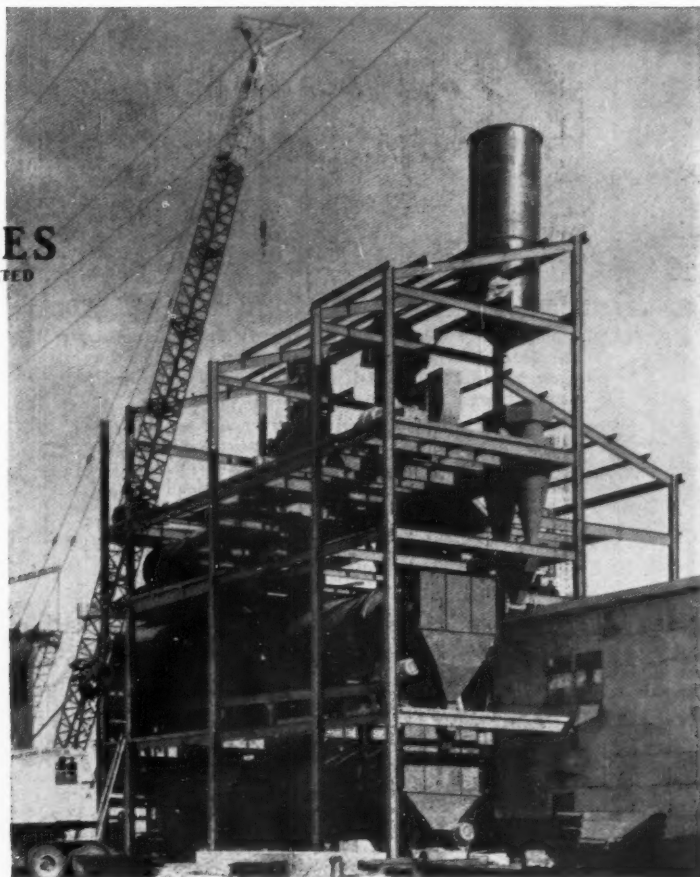
Crane removes 25-ft. cake from cooler.

Chemical Week • March 15, 1958



Fertilizer production unit of  
Land O'Lakes Creameries'  
Minneapolis plant, before  
siding was applied

**LAND O'LAKES**  
CREAMERIES INCORPORATED



## from an idea in June to productive operation in January —the Land O'Lakes Fertilizer Plant

In the opinion of several experienced fertilizer producers, time was too short to start from scratch in June 1955 and have a new fertilizer plant in operation to meet the 1956 market demands.

But Land O'Lakes management decided to flash the go ahead sign. In July Blaw-Knox accepted the challenge—to engineer, construct, and install a TVA continuous ammoniation and granulation system in time to produce for the 1956 fertilizer season.

Engineering was well under way in August. Ground broken in September. Structure housed by November. Final installations finished in December.

Operation started in early January. Well over 30,000 tons of granular fertilizer produced and sold during spring season of 1956.

That was the tight schedule maintained by Blaw-Knox—in spite of heavy snowfalls and temperatures that dropped at times to 30° below zero.

This was, of course, an unusual assignment. But it demonstrates the ability of Blaw-Knox to handle tough jobs. So when you are considering a modernization, an expansion or a new plant program, we would welcome the opportunity to study your project with you and submit our recommendations.



**BLAW-KNOX COMPANY**

*Chemical Plants Division • Pittsburgh 22, Pa. • Chicago 1, Ill.  
Birmingham • New York • Philadelphia • San Francisco • Washington, D.C.*

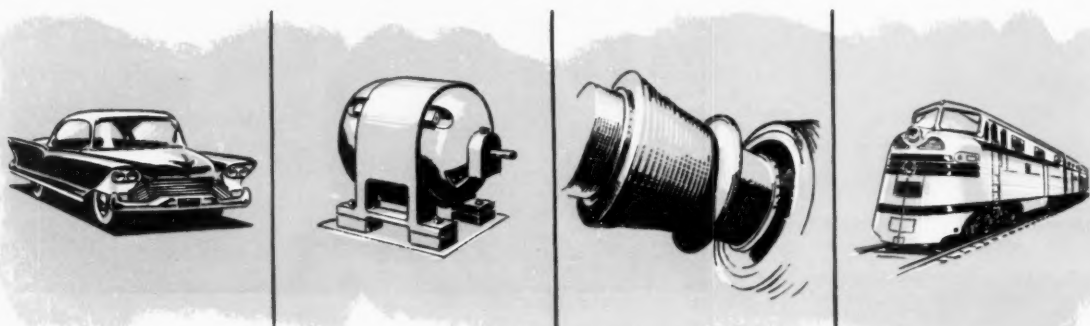
Designers, engineers and builders of plants for the process industries: chemical • petroleum • petrochemicals  
• resins and plastics • nuclear energy • fats and oils • fertilizers • synthetic fuels

# *Phosphorus pentasulphide helps inhibit oxidation and corrosion in light and heavy-duty lubricants*

Oxidation and corrosion inhibitors are derived from the action of phosphorus pentasulphide on unsaturated organic compounds or on high molecular-weight alcohols, which form a metal salt. These compounds may be the only additives present in light-duty crankcase oils. Along with other additives, they are used in heavier-duty oils.

When it is desired to use a primary and secondary inhibitor in the same oil, complex amines are mixed with the reaction products of phosphorus pentasulphide-polybutene. The mixture serves as anti-oxidant and corrosion inhibitor.

(Source: The Petroleum Engineer, March, 1956, article by C. J. Boner, "Addition Agents for Lubricants.")



## **AA Quality Chemicals**

**W**IDELY used by leading petroleum companies in making oxidation and corrosion inhibitors for lubricants, AA Quality Phosphorus Pentasulphide assures highest standards of quality and uniformity. It is made under rigid quality control from 99.9% pure Elemental Phosphorus . . . a product of our

own electro-thermal process plant and our own ample reserves of phosphate rock.

If our Research Department can be helpful to you in problems concerning phosphorus pentasulphide or any of the other AA Quality organic or inorganic phosphates, please write on your company letterhead for information.

The  
**American  
Agricultural  
Chemical  
Company**



Chemical Division: 50 Church St., N. Y. 7, N. Y. • 33 plants and offices serving U. S., Canada, Cuba

### **AA QUALITY® PHOSPHORUS PRODUCTS**

#### **PHOSPHORUS AND PHOSPHORUS COMPOUNDS**

Elemental Phosphorus (Yellow-White)  
Phosphorus Red (Amorphous)  
Phosphorus Pentasulphide • Sesquisulphide  
Ferro Phosphorus (Iron Phosphide)

#### **PHOSPHATES**

Disodium Phosphate • Trisodium Phosphate  
PHOS-FEED® BRAND Dicalcium Phosphate

#### **PHOSPHORIC ACID**

85% N. F. Grade • 75% Pure Food Grade  
50% Pure Food Grade  
Agricultural and Other Grades

#### **PHOSPHATE ROCK & FERTILIZERS**

All grades Florida Pebble Phosphate Rock  
Superphosphate  
Complete Fertilizers  
Agrinite®

### **OTHER AA QUALITY PRODUCTS**

#### **FLUORIDES & SILICOFLUORIDES**

Sodium Fluoride  
Ammonium Silicofluoride  
Magnesium Silicofluoride  
Potassium Silicofluoride  
Sodium Silicofluoride  
Zinc Silicofluoride  
Silicofluoride Mixtures  
Magnesium Fluoride

#### **GELATIN**

KEYSTONE® Gelatin: Edible, Photographic  
Pharmaceutical, Technical

#### **OTHER PRODUCTS**

Animal Bone Charcoal  
Bone Black Pigment (COSMIC® BLACKS)  
Bone Ash  
Bone Oil  
Keystone Ammonium Carbonate  
Sulphuric Acid

# Technology

## Newsletter

CHEMICAL WEEK  
March 15, 1958

**A new oil- and heat-resistant fluorinated rubber** was unveiled by Du Pont this week. Called Viton, it is a copolymer of vinylidene chloride and hexafluoropropylene. Du Pont says the product will resist oils and solvents (e.g., petroleum fuels, benzene, xylene, transmission oils, carbon tetrachloride) in the temperature range 400 F - 600 F. The new elastomer is destined primarily for military uses, will compete with silicone, Kel-F rubbers, Teflon.

**Ingots of superpure aluminum (99.99% pure)** are now being produced commercially by Kaiser Aluminum. The company has been turning out small quantities of the superpure grade for about three years, but now offers 6-, 15-, 30- and 50-lb. ingots. Likely uses include: catalysts used to make high-octane gasoline, foil for electrical capacitors, jewelry and other decorative consumer products. Neither Reynolds nor Alcoa has yet disclosed plans to produce aluminum of comparable purity in ingot form.

**Vaccine to combat cancer?** Three physicians at the Veterans Administration hospital in McKinney, Tex., believe they've turned up evidence that may lead to "development of a vaccine for treating some kinds of cancer." Researchers Dale Clark, Russell Wilson and James Finney have been working on the problem with volunteer patients and tissue cultures. Their findings indicate that cancer cells cause the body to produce cancer-inhibiting agents.

**Ethylene ureas and amides may have a future in treating cotton** fabrics to impart "wash and wear" properties. The compounds alter cotton's traits by forming polymers in and on the fibers. They will get further research at Battelle Memorial Institute (Columbus, O.) under a new contract with the U.S. Dept. of Agriculture.

**To speed development of economic high-level radiation** for industrial processing, AEC last week invited proposals for study and evaluation of radiation applications.

Three phases to be investigated under the contract include: (1) a summary of world technology on current and forecast uses of high-level gamma radiation; (2) a survey to determine current uses for quintalcurie (100,000 curie) and megacurie gamma irradiators on a commercial scale; (3) a comparison of technical and economic advantages of high-level radiation with those of other energy sources or chemical agents.

The study contract will cover applications in chemical, drug and plastics industries, will exclude food-industry uses currently being investigated by Army Quartermaster Corps. Proposals for the new contract must be submitted to AEC by March 21.

# Technology

## Newsletter

(Continued)

**A 10-year study of radiation hazards** will be conducted by New York University-Bellevue Medical Center under a \$500,000 grant from the Rockefeller Foundation. Research and teaching programs in radiation will be developed by a new staff under Dr. Norton Nelson, director of the center's Institute of Industrial Medicine. Goal: prevention or control of hazards threatening the general population and of special risks arising from the industrial application of nuclear power.

**Chemicals that kill sea lampreys without harming game fish** may prove an effective method in stemming the invasion of the Great Lakes by the predatory lamprey. In U.S. Fish & Wildlife Service tests, six halogen-containing mononitrophenols were found to be "significantly more toxic" to sea lamprey larvae than to fish or other water organisms.

And compounds that killed the larvae in less than 45 minutes had no apparent harmful effect on game fish; even at concentrations of more than twice the lethal dose for lampreys, less than 10% of the fish were killed. The chemicals are expected to be even more effective in streams than they were under laboratory conditions.

**A new method of electrorefining nickel** is now in use at the Port Colborne, Ont., refinery of The International Nickel Co. of Canada. Key: direct electrolysis of nickel matte, an artificial sulfide. By eliminating high-temperature oxidation and reduction operations, the process is said to permit—for the first time in nickel refining—the commercial recovery of valuable elemental sulfur and selenium by-products.

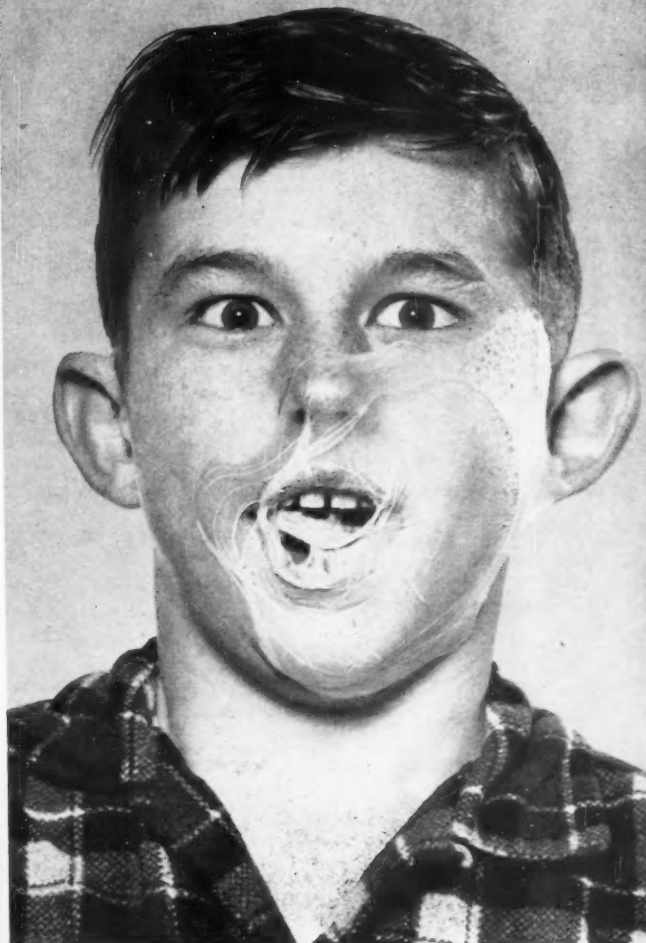
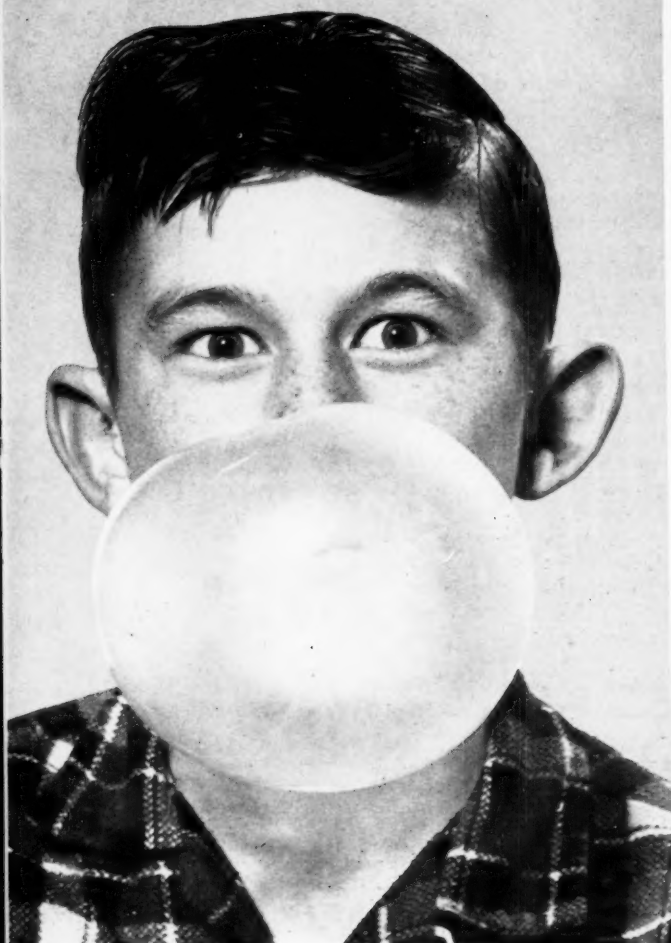
How it works: Electrolysis of nickel matte produces a metal-bearing anode sludge with a high content of elemental sulfur. Separation of sulfur and selenium is accomplished in a 100-ft.-high fractionating column of special design. By-product sulfur contains less than 5 ppm. selenium, has unusually low content of ash and bitumens. Selenium residue goes to Inco's Copper Cliff, Ont., copper refinery for recovery of pure selenium.

**The "total count" method of measuring flow by radioactivity** is described in patents (U.S. 2,826,699 and 2,826,700) issued this week to California Research Corp. Developed by CRC's Donald Hull, the technique has been applied to liquid streams ranging in flow from 1 cc./minute to the rushing cascade of California's American River (*CW*, July 27, '57, p. 80). Tracer substance: radioactive gold-198. Another version of the method, employing krypton-85, permits accurate measurement of gas flows from 1 to 100,000 cfm.

**Defense Dept. is allocating \$30 million more for basic research.** The money is being split this way: \$15 million for the Navy, and \$7.5 million each to the Army and the Air Force. Primarily, the money will be used to finance university research experiments.



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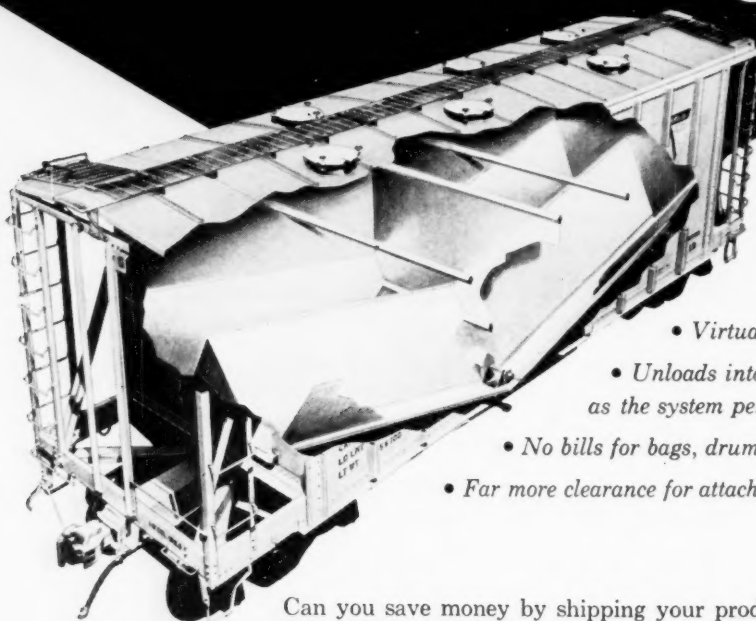
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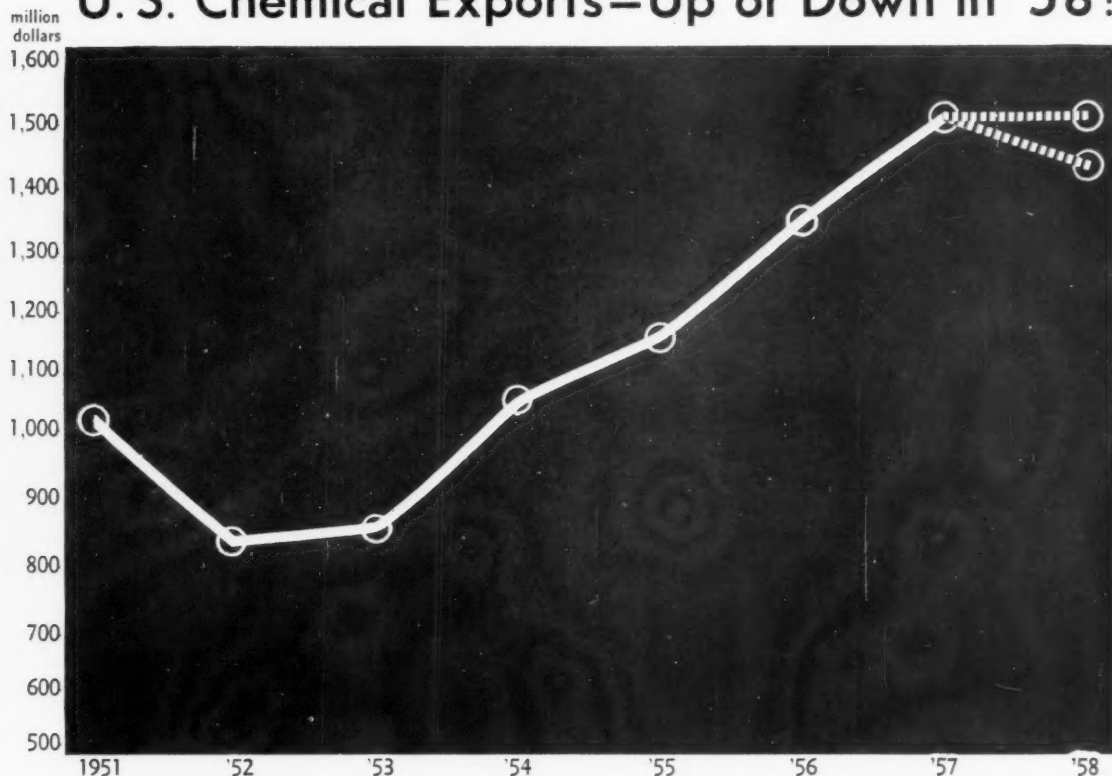


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# SALES

## U. S. Chemical Exports—Up or Down in '58?



## Chemical Exports Face Uncertain Future

Chemical producers in the U.S. and abroad are cautious and edgy about prospects for world chemical trade in '58. Although U.S. chemical exports climbed to a new peak of some \$1.4 billion in '57, few foresee further growth this year. Most are hopeful that U.S. exports will hold steady; but some predict a 5% drop.

Compounding the problem is the likely prospect that world chemical price levels will drop. Moreover, there's mounting evidence that Communist countries, for the first time, will seriously attempt to disturb global chemical markets. Iron Curtain chemicals are being offered in Brazil, for example, at attractive prices and for immediate delivery.

A slump in chemical exports will come at a crucial time for U.S. companies. Many have recently expanded foreign operations and set up international divisions. Many also are

counting on foreign sales—even at reduced prices—to keep domestic production at efficient output rates during the current recession. But the very same recession, dollar shortages, growing foreign output and stiffer international competition weigh heavily on short-term forecasts.

U.S. exports of all merchandise are expected to slump this year. The National Foreign Trade Council predicts an 8% drop—from \$19.3 billion last year to \$17.8 billion in '58. But about \$800-900 million will come from decreased oil and cotton exports. Both were abnormally high last year because of the Suez crisis and poor European harvests.

The major foreign markets for U.S. chemicals are Latin America, Canada and Western Europe. Brazil and Argentina are beset by currency difficulties. Mexico, Bolivia, Chile and Peru are earning fewer dollars because of

a slump in nonferrous metal prices. Moreover, there's some question about future prices and demand for South and Central American coffee, sugar and cotton. Generally, the "terms of trade" ratio (export prices/import prices) has been falling.

It's not surprising, hence, that Brazil expects to reduce its chemicals imports from the U.S. (especially fertilizers and caustic soda). It will probably keep its imports of European chemicals at the '57 level.

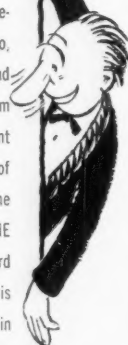
Mexico, largest Latin American importer of U.S. chemicals, expects its import rate to fall for at least the next two years. Formaldehyde, sulfuric acid, chlorine, acetic anhydride, ammonia, carbon black and polyethylene will be among the items hardest hit. Venezuela, however, will probably buy more—because of boom conditions there.

Canadian chemical firms predict

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## SALES

U.S. imports will decline also—perhaps as much as 5%—because of the U.S. recession, increased Canadian capacity and a push to purchase in the United Kingdom instead of in the U.S.

And in the Far East, Japanese and Indian buyers will undoubtedly reduce imports of U.S. chemicals. The dollar-rich Mideast and Pakistan, however, should remain good U.S. chemical customers.

Most prognosticators see Western European demand holding up, Germany especially should remain an excellent market. British purchase rates—at the moment—are uncertain; France, because of import restrictions and currency devaluation, will likely cut U.S. imports.

**Price Tumble?** Against this background looms the possibility of falling world chemical price structures. Many, but not all, U.S. chemical export managers contacted by *CW* report that they are seeking and getting lower export prices from sales departments. Some British chemical companies reportedly are selling without profit so they may remain in the market. German producers expect stiffened competition, pricewise, but are uncertain whether they will be able to pare prices further. World credit terms will remain extremely generous, despite isolated reports of British and German tightening of terms in Latin America.

At the same time, most foreign marketers expect sharply increased marketing activities. Many domestic and foreign companies are planning on larger sales staffs, heavier advertising and more integrated marketing efforts. In the U.S., this is taking the form of a trend to formation of international companies or divisions.

**Headed Up:** What's the outlook for specific chemical classifications? Opinions vary widely, but *CW* found agreement on some items. Agricultural chemical exports—insecticides, herbicides, fungicides, etc.—are expected to increase this year. Foreign sales of pharmaceuticals (except penicillin), fine chemicals and steroids may also improve. Plastics, ceramic raw materials and fiber chemicals (terephthalic acid, *p*-xylene, etc.) should also find brisker foreign demand in '58.

**Uncertain:** The outlook for a wide range of chemicals, particularly fertilizers, soda ash and glycols, is uncer-

tain—both optimistic and pessimistic forecasts abound. Nitrogenous fertilizer prospects hinge mainly on ammonium sulfate. Declining production of coke-oven material (because of less steel output) may result in actual shortages of material for export; producers of synthetic expect to sell production locally and at a better price than on the export market. If ammonium sulfate exports fall, scarcity rather than lack of demand will be the reason.

Supplies of dense soda ash are reportedly short in Europe. But opinions differ on how long the shortage will continue and on the severity of foreign competition in other markets. Petrochemical and detergent exports are other puzzlers. Increasing foreign production points to a falloff in U.S. exports (particularly glycols).

Foreign paint, varnish and cosmetic sales also are hard to gauge. Although demand exists, consumer items are often the first affected when currency exchange is restricted.

**Headed Down:** Demand for crude sulfur and sulfur-containing chemicals will probably tumble somewhat this year because of stiffer Mexican competition, increased production of recovered sulfur and a drop in metal processing. Some alkali exporters, too, are pessimistic—they can't buck European prices and credit terms. Nickel chemicals also are headed for severe European competition.

Potash and phosphate exporters are similarly apprehensive about the next 10 months. Potash firms expect a decline in both tonnage and price. Detergent phosphate sellers hope that tonnage may hold up but seem resigned to reduced export prices.

Exports of coal-tar products—especially dye and dye intermediates and phthalic anhydride—are freely predicted to decrease. And British and German producers also expect their exports of these products to slip.

No improvement is expected on a large line of items the U.S. is now exporting in small quantities. Included: chlorinated solvents and plasticizers.

**Red Threat?** Competition from Iron Curtain producers will likely worsen export problems. Besides the recent Brazilian development, Russian potash is now available in U.S. and Far Eastern markets. Russian or Chinese caustic soda is being offered at Hong



# BRIEFS

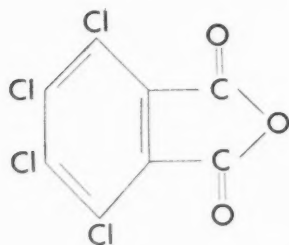
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Contents include detailed diagrams of equipment; a section on materials of construction; recommendations for unloading, diluting, piping, and storage; and a section on safety precautions and first aid.

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For more information on chemicals mentioned on this page, check here:

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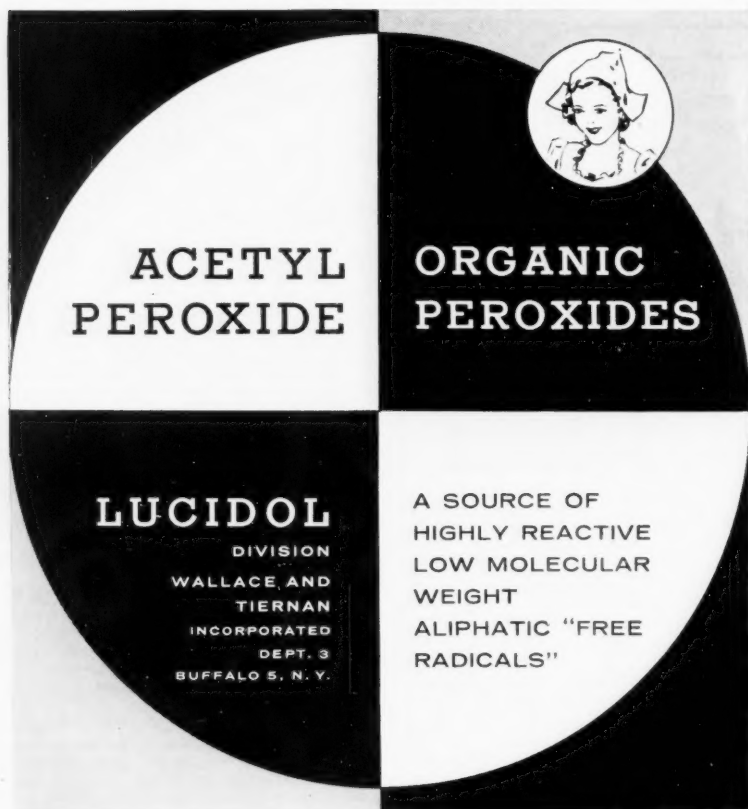
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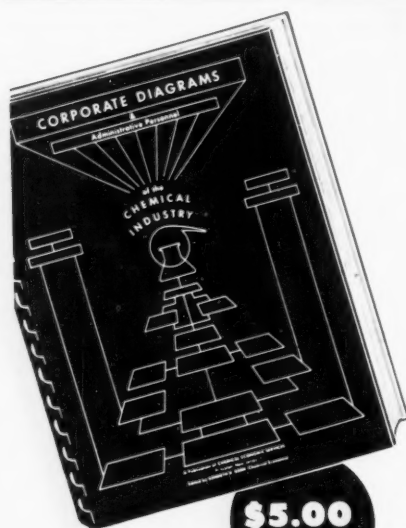


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## SALES

Kong. And India, moving closer to Russia, may import more drugs and dyestuffs from the Soviet bloc. Imports of Hungarian antibiotics have already become a problem in Mexico.

A leading spokesman for British producers warned *CW* that competi-  
tion from Eastern Europe "could quickly become quite serious because they are prepared to sell at a loss." Soviet bloc countries, he added, need the currency, want to build up West-  
ern markets and want to stir political trouble by dumping chemicals to dis-  
rupt the West's biggest moneymakers. British traders believe major Russian efforts will be aimed at the Mideast.

**Overseas Investment:** Export de-  
clines in some cases are attributable to rising foreign investments by U.S. and European companies and, hence, do not really constitute a loss. U.S. overseas investment has probably risen \$325 million over the '54 estimate of \$945 million. British manufacturers are aggressively pushing development in Commonwealth countries. And German firms also expect to expand overseas investment this year.

For the U.S., petrochemical invest-  
ment abroad will be the principal means by which producers can remain in foreign markets.

**Long-Term Outlook:** Although wor-  
ried about the immediate future, global exporters are markedly cheery about long-term markets. German producers expect export increases to average 3-4% in the next five years. British companies look for substantial growth in petrochemicals and poly-  
ethylene. South America—certain to expand industrially—should become a bigger chemical consumer. The Canadian chemical market, some econo-  
mists say, will grow moderately till '60 and then will spurt because of expanding population. Resources de-  
velopment, say the same sources, will accelerate sharply after '62.

U.S. exporters are somewhat less optimistic but are nonetheless hopeful. Too many factors, such as common markets and prospects of trade with Communist countries, cloud the crys-  
tal ball. Best potential will be for new products not yet in production abroad. How much they add will depend on the condition of the U.S. economy. If it expands—as predicted—world trade will probably boom. If it con-  
tracts—as it's doing now—world trade will slip.

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SH 58-1



# Market Newsletter

CHEMICAL WEEK

March 15, 1958

**Monopentaerythritol tags were notched down a full 1½¢/lb.**

late last week because of some swift competitive moves by major producers Heyden Newport and Hercules Powder. The cuts follow, by just a few weeks, earlier reductions that lopped 1¢/lb. off mono-PE prices and 2½¢/lb. from technical PE tags.

As matters stand now, both mono and tech material have identical quotes: in bags, c.l., delivered East of the Rockies, 29½¢/lb.; l.c.l., 30½¢/lb. Drum prices are ½¢/lb. higher, and a 1¢/lb. premium is quoted on West Coast shipments in bags or drums.

•  
**The cut in PE prices is reviving sales;** volume shipments are beginning to pick up, in contrast with sluggishness of the past few months. Tabbed as the chief reason: the reductions brought PE tags more in line with prices of glycerine (especially for alkyd outlets) and with other polyols in general.

•  
**And nonylphenol customers are now paying 5¢/lb. less for tank-car and tank-truck requirements,** saving 4½¢/lb. on drum and less-than-drum quantities from producer Rohm & Haas. The intermediate, used in producing nonionic detergents, lubricating oil additives and stabilizers for vinyl plastics, sells for 19½¢/lb. (tanks); 22¢, c.l. and t.l., in 400-lb. drums. Add 2¢/lb. for West Coast shipments.

•  
**Further evidence of selenium market-easing is a new 50¢/lb. cut** in domestic schedules that brings regular-grade material down to \$7/lb. It's a dramatic reversal of the situation a couple of years ago, when selenium topped the list of "critically short" items and resellers were putting 100% markups on the metal.

There's some question whether domestic prices will remain at the current level. Some trade sources say that a few "distressed parcels are being quoted at \$6.50/lb. subject to prior sale."

•  
**"Rising production costs" is still a potent factor in pricing—it's** the chief reason American Agricultural Chemical gives for its slated April 1 increase on amorphous red phosphorus. The hike (10¢/lb.) will raise c.l. and t.l. prices to 60¢/lb., and l.c.l. quantities a cent above that. Prices are quoted on an f.o.b. works, freight equalized basis.

•  
**The U.S. copper market is still shaky,** but there's some sentiment among traders that the months-long price cutting fever may have abated. Primary producers are sticking with the 25¢/lb. price instituted in January, and custom smelters are apparently reluctant to drop the price any lower than the 23¢/lb. they posted a couple of weeks ago.

## Market Newsletter

(Continued)

Overseas, the situation is even firmer—London copper values moved up ½¢/lb. last week; a major Belgian Congo producer advanced tags twice in less than a week.

**Easing of export limitations on some nickel** and nickel-bearing scrap materials by the Bureau of Foreign Commerce underscores an improved U.S. domestic supply situation. The bureau has also established a first-quarter supplemental quota of 200,000 lbs. for exports of pure nickel powder, nickel anodes, and shot. That's in addition to the previously announced quota of 250,000 lbs.

An export quota of 450,000 lbs. has been set for the second quarter, against which applications for export licenses may be filed with the bureau between April 1 and May 1.

**A sales battle for Mexico's titanium dioxide market** is a step nearer this week (*CW*, Sept. 14, '57, p. 96). Glidden, racing with Du Pont to be first in with a plant in Mexico, will halt TiO<sub>2</sub> operations at its Baltimore-St. Helena installation March 31, dismantle and ship the production equipment to Mexico for a plant to be built by Glidden's licensee, Industrias Quimicas Basicas of Mexico, S.A.

Meanwhile, Du Pont's subsidiary, Du Pont, S.A. de C.V., is pushing "full steam ahead" to complete a \$2.8-million, 5,000-7,000-metric-tons/year TiO<sub>2</sub> plant at Tampico, Mex. Du Pont has been supplying Mexican dioxide imports for 15 years or so, had a virtually clear field until Glidden avowed to vie for a share in the near-5,000-tons/year market. Significantly, market observers have said there just isn't room for both companies, which points up the hot sales situation that's developing.

**The case of the vagrant question mark** in the headline over last week's phthalic anhydride market story (*CW*, March 8, p. 63) has some marketers in a dither. The article itself projects the industry's insistence that no price cut is in sight. But a few copies slipped out with the question mark inadvertently omitted from the headline, giving the impression that a price slice was imminent. The correct "head," which appeared in most copies: "Setting the Stage for Phthalic Price Cut?"

### SELECTED PRICE CHANGES—WEEK ENDING MARCH 10, 1958

	Change	New Price
DOWN		
Monopentaerythritol, bgs., c.l., dlvd. E.	\$0.015	\$0.295
Nonylphenol, dms., c.l., frt. alld.	0.045	0.22
Oleic acid, single dist., tanks	0.015	0.16
Phosphate rock, Florida, land pebble, run-of-mine, washed, dried, unground, 66-68% b.p.l., bulk, c.l., mines, long ton	0.05	5.11

All prices per pound unless quantity is stated.



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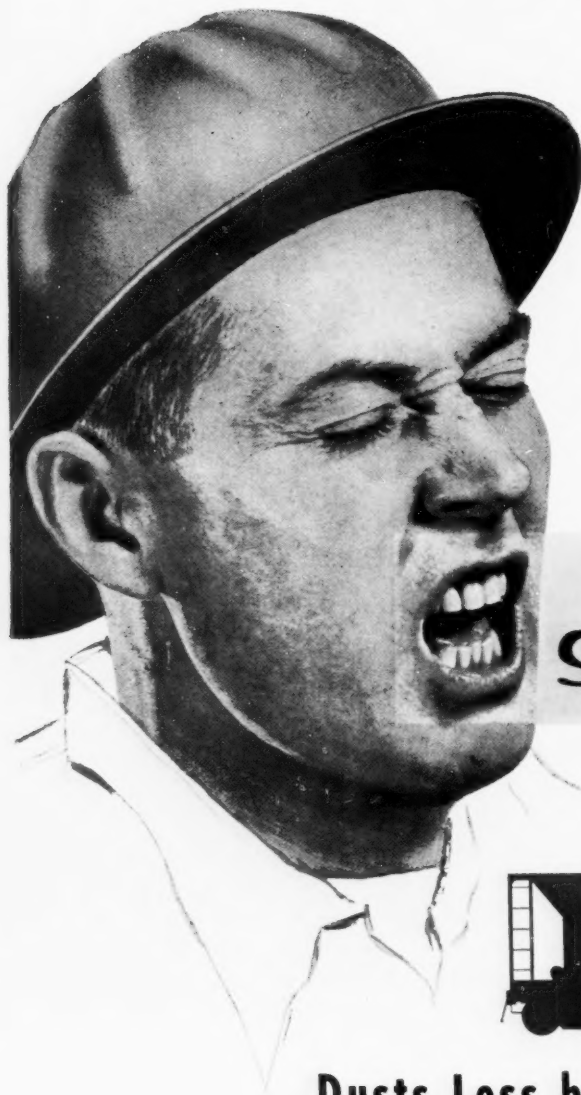
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Delegates\* cite "best resolutions" made at international labor talks.

## Setting ILO Safety Goals

Look for renewed interest in safety and health factors in chemical plant design as a result of the recent conference of the Chemical Industries Committee of the International Labour Organization in Geneva, Switzerland.

Interviews last week with just-retained U.S. delegates indicate that of the three resolutions proposed at the committee's fifth session, one concerning "Prevention of Occupational Diseases and Poisoning in the Chemical Industries" may have most significance for U.S. chemical processors. In essence, it requests that ILO compile a

list of the best measures used in health risk control, that it collect and disseminate information about dangerous substances and their control, and that it compile and maintain a list of those substances.

**Labor View:** Delegates from labor groups look upon the resolution as most constructive. Commented Oil, Chemical & Atomic Workers Union Vice-President Elwood Swisher: "Of all the discussions there, I believe those on occupational health and safety were of the most significance to U.S. and Canadian chemical management and labor. To give just one example, the American chemical industry will no doubt be highly interested in the discussions on health and

safety considerations in plant design."

In these discussions, it was brought out that design engineers and chemists should consult with health authorities in the early stages of plant design. Most of the big companies in the U.S. do this, of course, but some of the smaller ones do not always do so, it was alleged.

Among other resolutions, which will be placed on the general agenda of ILO's 1959 general session, is a blueprint of terms and provisions that should be in union-management labor relations pacts. Another asked that governments consult with their workers' and employers' organizations about protection and compensation resulting from atomic energy hazards before any conclusions are drafted for presentation to ILO's '59 session. A report is already under way.

MCA's Maurice Crass says the meeting was "the most cooperative and harmonious session I have attended . . . however, I do have certain personal reservations . . . One of these is that the U.S. stands to gain very little of a technical nature . . . particularly when the agenda includes controversial items."

He adds that a number of items of discussion were contrary to U.S. custom, "and in some instances, to the federal statutes" covering industry-wide bargaining.

Crass feels that future meetings should concentrate on imparting knowledge and experience rather than on argument over the drafting of formal documents and resolutions.

Generally, delegates felt the conference will prove productive. Canadian Gordon McIlwain, vice-president of International Chemical Workers Union—a third-time delegate—said that this year's resolutions, as a whole, were the best in his experience.

U.S. government delegates were Henry M. Doyle, assistant chief, occupation health branch, U.S. Public Health Service, and George Tobias, attache for labor affairs, U.S. resident delegation (Geneva). For employers: Maurice F. Crass, Jr., Manufacturing Chemists' Assn. secretary-treasurer, and E. W. Dwyer, personnel relations director of Monsanto Chemical. Laron K. Judd, vice-president of ICWU, and OCAW's Swisher were on the employee delegation.

\*Left to right: Satoshi Tanikawa, Mitsubishi Chemical Industries, Ltd., Japanese delegate; E. W. Dwyer, Monsanto, and Maurice F. Crass, Jr., Manufacturing Chemists' Assn., U.S. employers' delegates.



United Dye & Chemical's Dardi faces big poser this week . . .

## After Stock Delisting, What?

This week, management and directors at United Dye & Chemical Corp. were struggling with a critical problem: Now that United Dye's common stock has been delisted by the New York Stock Exchange (effective March 3), how will the stock be sold? What corporate changes, if any, should take place?

Anchor man on the management team wrestling with these problems is Virgil Dardi, United Dye's president. To Dardi, the delisting—caused by the company's failure to measure up to certain exchange minimums—is no indication that the firm's financial structure is basically at fault. In his opinion, the company is making a strong bid for financial stability and "is in a sounder condition than at any time in its present history."

Delisting, following a Jan. 21 hearing before an exchange subcommittee, was ordered because United Dye failed to meet two minimum requirements of the exchange: the New York-based, Delaware-incorporated firm's common stock does not have the necessary aggregate market value of \$2 million, as required by the ex-

change, and its average net earnings after taxes for the past three years have not met the exchange minimum of \$200,000/year.

In fact, the company has reported a net loss each year since '54. For the first nine months of '57, the total net deficit of the company and its domestic subsidiaries was \$552,395 (including a loss of \$473,062 on the sale of Bon Ami Co.).

Aggregate market value of the common stock Jan. 17 was 887,368 shares at 1 $\frac{7}{8}$ —\$1.7 million.

**The Brighter Side:** At the hearing, United Dye's attorney pointed out that the company's \$3.9-million net tangible assets "far exceeded" the exchange's minimum. Net working capital increased \$873,309 during '57 (period ending Nov. 30), and short-term obligations were reduced from \$2.1 million in '56 to \$1.5 million as of Nov. 30, '57. Since then, the company has realized \$620,100 in cash from the sale of the subsidiary British Dyewood Co., applying \$425,000 to further reducing short-term obligations to \$1.1 million.

Long-term obligations (on a con-

solidated basis) have been reduced from \$2.8 million in '56 to \$2.2 million on Nov. 30, '57. Book value of the company's common stock was \$4.44/share last Nov. 30, compared with a deficit of \$12.96/share Oct. 31, '55, prior to the merger with Handridge Oil Co. (Denver).

Dardi plans no drastic corporate changes, expects to proceed as usual, "removing deadwood when necessary."

Meanwhile, company management appears to lean toward listing the stock on the American Stock Exchange, although application hasn't yet been made. "In any event," says Dardi, "an active over-the-counter market for the stock is anticipated."

## Work Law Clashes

Colorado last week could be counted a member of the rapidly growing group of states unofficially designated as "right to work" battlegrounds for 1958.

Along with Kentucky, Washington and California (*CW*, Jan. 25, p. 89), Colorado figures to be headed for open warfare over a state law that, in essence, outlaws the so-called "union shop."

Latest maneuver in the Colorado fracas: sponsors of a "right to work" amendment to the state constitution served notice that they're ready to appeal to the state supreme court in a dispute over the amendment's title as it would appear on the ballot next November.

"Right to work" advocates rejected a ballot title drawn by Secretary of State George Baker, Attorney General Duke Dunbar, and supreme court reporter Floyd Miles. The title they suggested refers to the proposed amendment as: "An act . . . providing that membership or nonmembership in any labor union . . . shall not be cause for denying employment . . . And providing that no contract, agreement or understanding shall [require] . . . membership or nonmembership . . . as a condition of employment."

Ben Bozeman, attorney for the amendment's supporters, proposed a title including the phrase "freedom to work." State officials rejected this proposal as well as a suggestion to include the phrase "right to work" in the title.

# Stepan Methyl Esters

The new Stepan plant at Millsdale, Illinois (near Joliet), includes a high capacity methyl esters production unit. This unit, of the very latest design, is now producing a wide range of methyl esters from coconut oil of high purity and excellent uniformity. These products, as intermediates, offer you interesting possibilities for improving your product or products.

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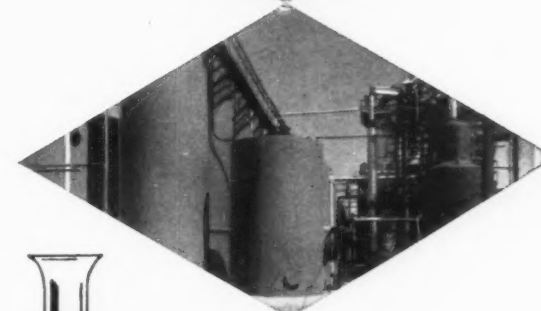
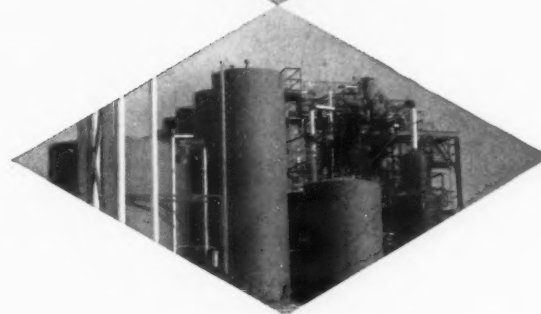
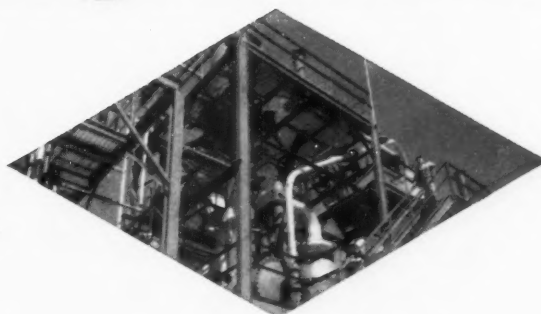
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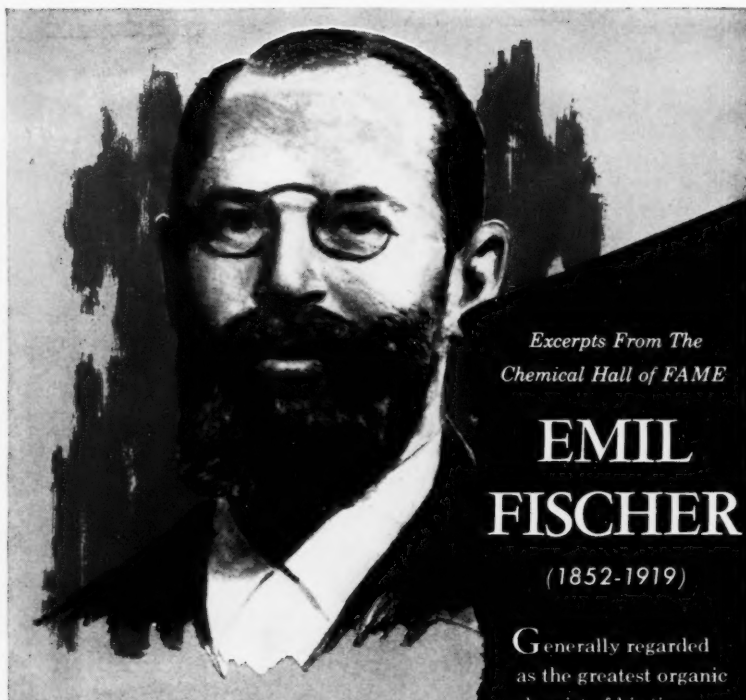
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## ADMINISTRATION

### LABOR

**Barrier Down:** Two more barriers to union organizational activity have fallen, this time in Kentucky.

At Covington, last week, eastern Kentucky district court issued a temporary injunction barring the city of Falmouth from enforcing an ordinance providing for licensing of labor organizers. The injunction was sought by the Kentucky State Federation of Labor and the Allied Industrial Workers (AFL-CIO). The ordinance requires a \$2,500 license fee for organizing of any kind and stipulates that an organizer must be a resident of the community for five years.

At Russellville, Ky., an ordinance requiring a \$25 license fee for organizers has also been voided. Similar ordinances are still in effect at Cave City and Scottsville, and union lawyers plan to seek injunctions there, too.

**Labor Practice Case:** International Chemical Workers Union's complaint that Mobay Chemical Co. used unfair labor practices at New Martinsville, W.Va., is being investigated by National Labor Relations Board. NLRB has assigned a field examiner to meet with Mobay and ICWU Local 566 concerning alleged "refusal by the company to bargain in good faith in respect to wages, hours and other terms of employment." No specific citations have been made. Employees at the plant voted for union representation last October. Donald Miller, plant manager, says the "management met nine or 10 times with union officials in attempts to settle differences."

**Joint Negotiation:** Dow Chemical Co.'s Texas Division has concluded amendments to contracts with 10 unions; the agreements extend to June 1, '60 contracts signed in '56 that were scheduled to run to June 1, '59.

Amendment terms include a 5¢-hour hike in all wage rates, retroactive to Feb. 3, plus a 7¢ rise June 2 and a 6¢ increase Dec. 1. Renegotiation date was set for June '59. An eighth paid holiday, liberalization of vacation plans, seniority provisions in the event of layoff, and sick-pay improvements and other changes affecting individual unions were also included.

**Labor Mergers:** The number of mergers of AFL and CIO state bodies





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**Dr. Erle Ayres answers some pertinent questions on**

## **THE AMINE-BORANES**

*"interest centers around their catalytic, stabilizing and antioxidant properties and their selective reducing action in non-aqueous solvents"*

**Q.** Dr. Ayres, what are the Amine-Boranes?

**A.** They are complexes of borane ( $\text{BH}_3$ ) with amines. Most secondary and tertiary amines form stable complexes.

**Q.** What Amine-Boranes are offered?

**A.** Dimethylamine-Borane,  $(\text{CH}_3)_2\text{NH}:\text{BH}_3$ , Trimethylamine-Borane,  $(\text{CH}_3)_3\text{N}:\text{BH}_3$ , (white solids) and Pyridine-Borane,  $\text{C}_5\text{H}_5\text{N}:\text{BH}_3$  (colorless liquid) are available now in moderate quantities. Larger quantities will be produced at our new Lawrence plant later this year. Other Amine-Boranes will be prepared as compounds with different properties are needed. We'd be glad to hear of your requirements for other Amine-Boranes.



**Q.** Can you make Amine-Boranes using primary amines?

**A.** At room temperature primary amines yield amino-boranes; at higher temperatures borazines or boron-nitrogen polymers result.

**Q.** How stable are the Amine-Boranes to heat?

**A.** Trimethylamine-Borane can be heated for many hours at  $125^\circ\text{C}$  without change. Dimethylamine-Borane starts to lose hydrogen at  $80^\circ\text{C}$  to produce aminoborane. Pyridine-Borane does not decompose at  $100^\circ\text{C}$ .

**Q.** What happens to the Amine-Boranes in acid?

**A.** The Amine-Boranes are stable in glacial acetic acid. Dilute mineral acids hydrolyze them; with Lewis acids diborane is generated.

**Q.** What are some other solvents for Amine-Boranes?

**A.** Benzene, ethers and hexane. Pyridine-Borane is also very soluble in alcohol and pyridine.

**Q.** How stable are these compounds in water?

**A.** Trimethylamine-Borane loses about 2-3% of its active hydrogen per day. Higher tertiary Amine-Boranes should be even more resistant to hydrolysis.



Dr. Erle Ayres, Ph.D., Duke University  
Marketing Division, Callery Chemical Company

**Q.** Are the Amine-Boranes toxic?

**A.** They are much less toxic than the boron hydrides. Until more is known about their toxic properties skin contact or inhalation of vapors should be avoided.

**Q.** You mentioned stabilization, can you give an example?

**A.** Our preliminary screening has shown that methyl methacrylate is inhibited against polymerization at room temperature for a year, but can then be polymerized by heat in the presence of the Amine-Boranes.


**Q.** Is there much interest in the Amine-Boranes?

**A.** Yes. We've answered over 1000 inquiries in the past six months from a wide variety of industries and are now beginning to get promising reports on the samples out for evaluation.



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## ADMINISTRATION



**Meany:** Ready to force an overdue union merger in New York state.

is steadily rising. AFL-CIO President George Meany called for a meeting last week of leaders of the New York state CIO Council and the State Federation of Labor to meet with him to discuss terms of consolidation. The deadline is two months past, and Meany says that if no accord is reached at the meeting the parent federation is likely to force a merger.

Meanwhile, in Michigan, state labor organizations consolidated last week, forming a group representing more than 700,000 workers. This was an "enforced merger."

In Florida, apparently, no enforced merger is needed. The groups there have agreed that late this month they'll turn in their separate charters to AFL-CIO and create a single body of about 70,500 workers.

## IDEAS

**Koppers' Design Competition:** Koppers Co.'s (Pittsburgh), 1958 Design Competition for Plastic Toys offers \$1,000 first prizes to winning molders in each of five classifications. Each winner also will select a summer camp for handicapped children to receive \$1,000 from Koppers. Purpose of the competition is to promote and upgrade the use of plastics in toys; it's open to molders, extruders, fabricators and proprietary manufacturers of polystyrene and polyethylene toys.

**Instant Safety:** National Safety Council (Chicago), is offering a "handy, compact" check-list of safe



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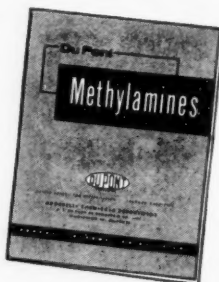
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## **ADMINISTRATION**

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## **LEGAL**

**Sues for Exclusive Rights:** SchenLabs Pharmaceutical has filed suit in U.S. district court (New York) against Farbenfabriken Bayer (Leverkusen, West Germany), seeking clarification of U.S. rights affecting distribution of the German concern's agricultural products. Chemagro Corp. and Pittsburgh Coke & Chemical Co. (both of New York) were named codefendants in the suit.

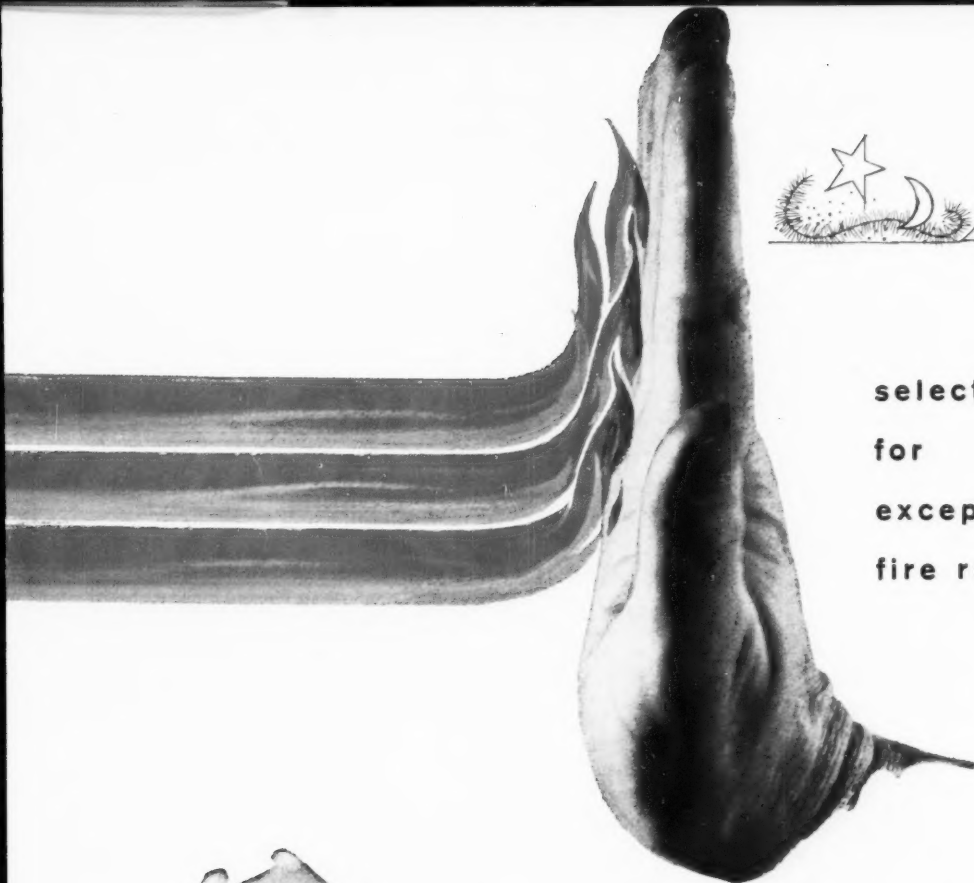
SchenLabs, a subsidiary of Schenley Industries (New York), is asking the court to: (1) enjoin Bayer from making available to Chemagro or others its products for sale in this country; (2) enjoin Bayer from itself exploiting its products in this country; (3) direct the three defendants to transfer and assign to SchenLabs all plants, properties, materials, equipment and monies derived directly or indirectly from the sale of Bayer products in this country; and (4) declare a judgment against the defendants for the full amount of damages, plus interest.

SchenLabs says that in 1949 it entered into an exchange agreement with Bayer for exclusive rights on insecticides and other agricultural products. The agreement, SchenLabs says, gave each of the parties involved exclusive rights to the other's agricultural products in its own country.

**Advertising Suit:** Two doctors have entered a \$1-million suit against Wonder Drugs Corp., Drug Research Corp. and Kaster, Farrell, Chesley & Clifford, Inc. (all of New York), charging misuse of their names in connection with advertisements of the defendants' products.

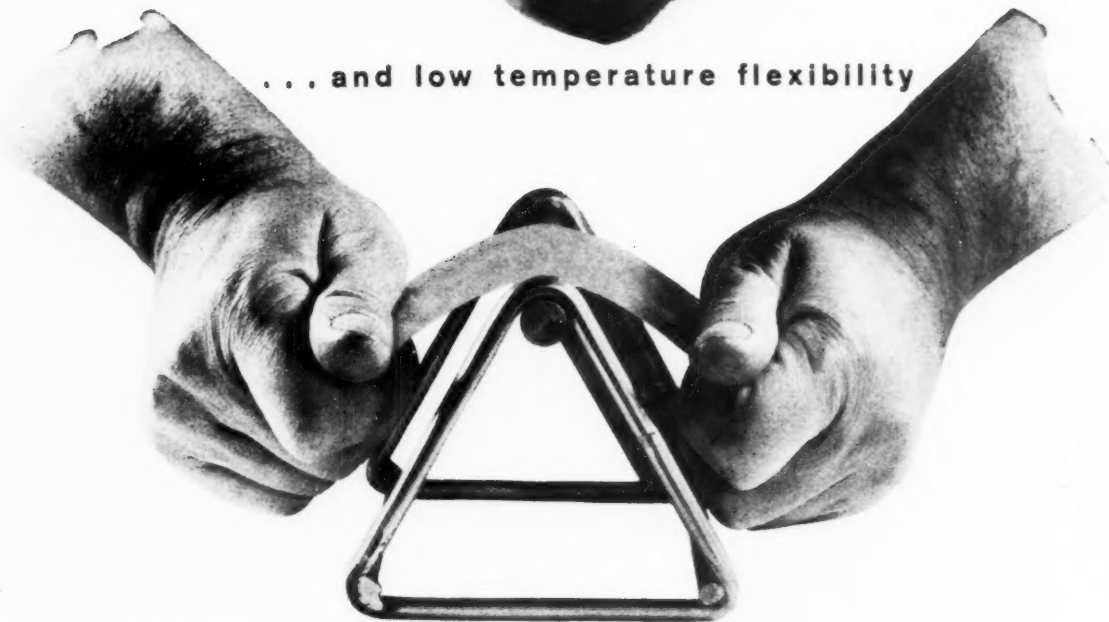
The complaint, filed by Drs. Nathan Colton and Hyman I. Segal, in U.S. district court (New York), charges that advertisements by the companies were calculated to convey the "misleading and false" impression that the doctors endorsed use of "Regimin Tablets." The complaint also charges that the doctors' names were used without permission.





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Man and boy at right dramatize size of this 80' x 360' Stran-Steel building owned by West Jersey Warehouses, Inc., of Bridgeton, N.J. Here is 28,800 square feet of working space.

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## ADMINISTRATION

### KEY CHANGES

**John R. Eck**, to president, Mobay Chemical Co. (St. Louis, Mo.), jointly owned subsidiary of Monsanto and Farbenfabriken Bayer AG.

**Russell M. White**, to general manager of the new International Division, Stauffer Chemical Co. (New York).

**S. Warren Lee**, to vice-president and director of the Scientific Division, White Laboratories (Kenilworth, N.J.).

**Floyd B. T. Myhre**, to assistant to the president, Witco Chemical Co. (New York).

**Charles W. Colglazier**, to controller, Chemical Products Division, National Cylinder Gas Co. (Chicago).

**A. J. Thoma**, to vice-president and controller, Air Reduction Co. (New York); and **J. J. Lincoln, Jr.**, to president, Pure Carbonic Co., division.

**Keith R. Cranker**, to director of research and development, Plumb Chemical Corp. (Philadelphia).

**J. A. Kelley**, to president, Zonolite Co. (Chicago).

**Gerald G. Priest**, to manager of product development and research, Dixie Chemical Co. (Houston, Tex.).

**James M. Knox**, to executive vice-president and treasurer; and **H. J. White**, to secretary; Research-Cottrell (Bound Brook, N.J.).

**Milton L. Selby**, to director, Cutter Laboratories (Berkeley, Calif.).

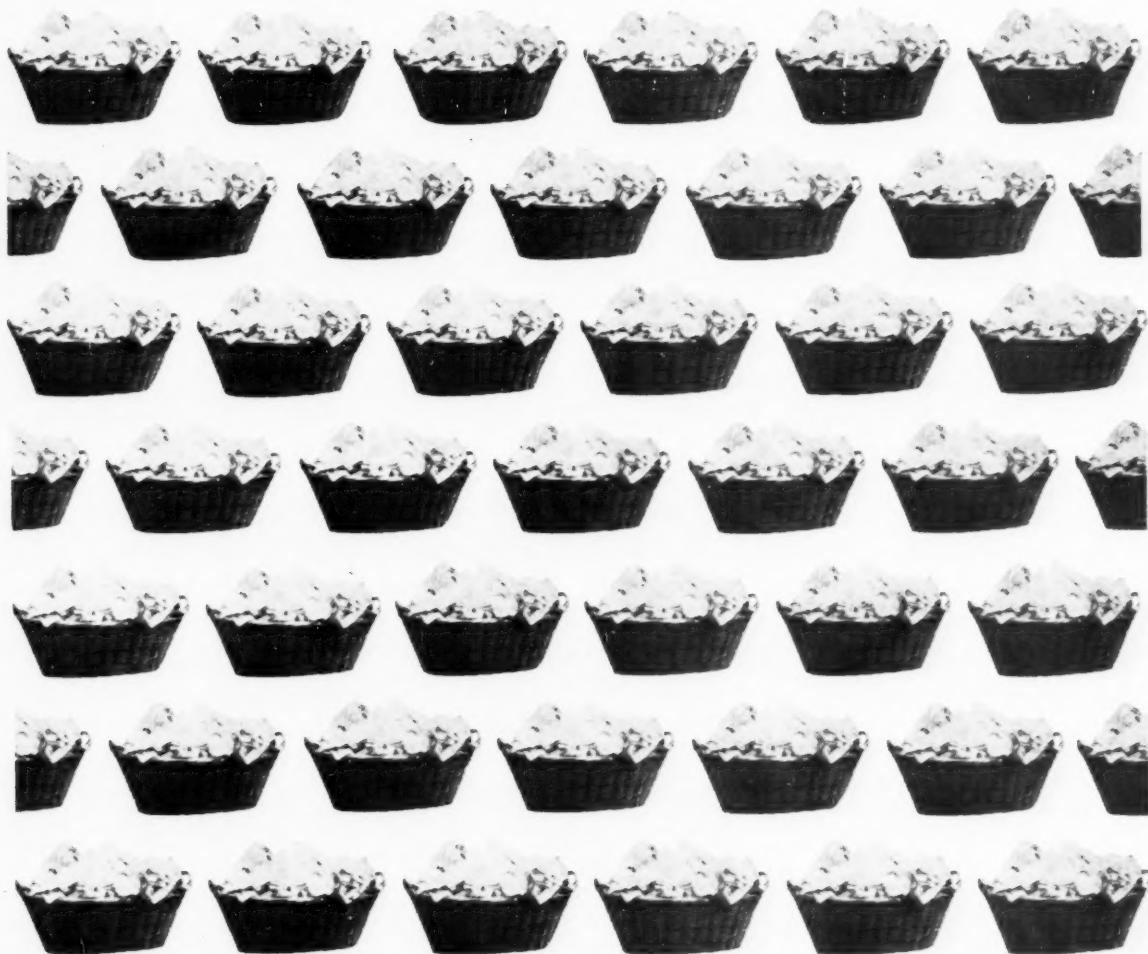
**Everett Griffin**, to director, Chemical Process Co. (Redwood City, Calif.).

**George B. Hardy**, to manager, Desiccant Division, Culligan, Inc. (Northbrook, Ill.).

**Fred M. Hakenjos**, to manager of the newly formed Chemical Propulsion Division, Explosives Dept., Hercules Powder Co. (Wilmington, Del.).

**Hulbert S. Aldrich**, to director, National Distillers and Chemical Corp. (New York); and **George C. Cook**, to manager of chemical market research and development, U.S. Industrial Chemicals Co., division.

**Leon Parker**, to vice-president, H. I. Thompson Fiber Glass Co. (Los Angeles).



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Unsaturation, as 2-Ethylhexenal .....	0.15% max.
Acid Reflux Color, APHA .....	100 max.
DOP Text Color, APHA .....	100 max.



## Four Steps in Enthone's Development

1. Incorporated in '42 (yearly sales \$167,000).
2. Started foreign licensing arrangements in '51 (sales: \$1.8 million).
3. Purchased by American Smelting and Refining Co.; extended licensing in '57 to eight companies—five foreign and three domestic (sales: \$3 million).
4. Forms first foreign subsidiary in Mexico in '58; adds sixth foreign licensee.

## Foreign Licensing: One Firm's Growth Plan

Enthone, Inc.'s (New Haven, Conn.),\* agreement late last month with Compagnia Italiana Galvano Tecnica, under which the Italian firm will make and sell some of Enthone's metal-finishing specialties, marks the ninth such agreement by the U.S. company since '51. Such contracts have allowed Enthone, with '57 sales of only about \$3 million/year, to become an international factor in sales of metal-finishing products.

Specialties makers who think that companies must be giants before they can venture into international markets might profit by observing Enthone's methods. Here's how Enthone's president and founder, Walter R. Meyer, traced the company's growth for *CW*:

Enthone started in the early '30s, when Meyer began turning out metal-finishing products on a spare-time basis while working as a chemist with Sargent & Co. (New Haven). In '42, Enthone was incorporated, and Meyer took over as full-time president. Sales—\$55,397 in '41—rose to \$166,719 in '42.

In '51, Meyer tried his first experiment at expansion. With sales of only \$1,771,825 that year, it was obvious that the company couldn't afford to build or buy. It decided to try licensing.

Meyer felt that his metal strippers

and other products—including the first known processes for blackening copper and brass, and some of the first enamel strippers—had promising potential in world markets as well as in the U.S. This turned out to be a correct assumption, and the first arrangement was made with a Brazilian manufacturer.

This market plan worked so well that Enthone quickly arranged two more royalty setups—this time in the U.S.—with Ardeo, Inc. (Chicago) and L. H. Butcher Co. (Los Angeles). These were followed by pacts with four European companies\*\* (in '54) and a royalty arrangement with Nicromatic Ltd. (Toronto, Can.). South America became a market by agreement with Commercial e Industrial de Fornos Werco Ltd. (Rio de Janeiro).

**Foreign Entanglements:** Meyer makes a good case for using a royalty system instead of exporting. He explains that when the company tried shipping materials overseas it found itself constantly tangled in problems of money exchange, government approval, and shipping.

In contrast, royalties, though yielding smaller profits, have these advantages: they allow a company to

get a product off to a faster start, since well-established companies make and sell it; they keep management problems small; they permit a form of expansion that doesn't involve risk of capital.

Enthone doesn't deal exclusively through licensing arrangements, however. It still ships certain of its made-in-U.S. trade formulas—usually under code names. This procedure is sometimes upset by customs regulations, which require a detailed description of exported products. Customs officials sometimes create another problem for the company: some slower-acting officials—especially in South America—make it necessary for licensees to anticipate raw-materials needs two and three months ahead of the time such calculations would ordinarily be made.

In many countries, government approval is needed before dollars can be taken out. Therefore, Meyer says, it's a lot easier to get approval for royalties and raw-materials payments than for payments for finished products. And, of course, a local company manufacturing and selling a product (under the Enthone name) avoids all the other complexities of dealing with local ordinances, transportation systems and the like.

Technical work for Enthone's licensees is done in the U.S.—sometimes an involved procedure. In France and Germany, petroleum sol-

\*\* In the British Isles, Switzerland and Australia, the Enthone licensee is M. Alkan Ltd. (Middlesex, England). In West Germany, Holland and Austria, it's Dr. W. Kampschulte & Cie. (Solingen). In France, Spain, Portugal, Belgium and Luxembourg, it's Industrielle de Fournitures Pour L'Electrolyse (Paris). Only one company, Kampschulte, has return agreements—Enthone makes that firm's products under royalty.

\* Wholly owned subsidiary of American Smelting and Refining Co.

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vents are different and require different emulsifiers. In Brazil, power resources are small, and metal finishers seldom have heated equipment, so that formulations must be adaptable to cold processing. In Mexico City, the high altitude (7,000 ft.) is a problem, sometimes causes highly volatile chemicals to boil away at room temperature. In South America and Mexico, metal finishers seldom use exhaust fans — they work in open sheds. This often results in contamination of chemicals by atmospheric pollutants.

Another problem overseas: many suppliers' use of obsolete and inferior packaging materials (carboys in France, for instance, are little more than large wine jugs).

But Enthone has found that, once a product has been launched, there's little in the way of technical service that can't be handled by correspondence.

Other liaison between Enthone and its licensees is usually handled by a representative who is sent to the licensees' plants about once every two years to meet with sales, management and technical people. The licensees occasionally send men to New Haven. Since the Midwest is such a big market area, Enthone keeps two full-time service engineers at the Chicago plant of Ardeo, Inc.; they often deal directly with customers.

Royalties are on a sliding scale, based on the licensee's profits (Enthone doesn't try to set prices, lets each company base prices on the local market.)

Though Enthone chose the royalty route to success, there's some indication that it is also trying more conventional growth techniques. On Feb. 14, it announced the formation of Enthone de Mexico S.A., its first subsidiary. This break with its traditional pattern of operations may stem from its absorption into the American Smelting and Refining Co. organization last May. Asarco, of course, has the money to buy or set up companies and has worldwide connections in the industry.

Whatever its course in the future, Enthone, a small company in a comparatively small industry, has shown that it's entirely possible for a smaller firm to expand its business substantially on a worldwide basis without a crushing investment of effort and money.

## Paint Outlook: Fair

Speaking before the National Paint, Varnish & Lacquer Assn. in Boca Raton, Fla., last week, Paul J. Weber, assistant treasurer of Hercules Powder Co., outlined some economic factors that will likely result in loss of sales of paint and allied products in the near future.

He foresaw a likely decline in paint and varnish sales "of at least 3% in '58." More hopefully, he felt that the acute phase of inventory liquidation would be completed in the next few months.

Charting the future of specific coatings markets:

- The output of household furniture will drop 3% under last year's production total.

- Passenger car output will plummet 15-20%.

- Private housing, probably the brightest spot, will be either unchanged from last year's level or show an increase of up to 10%.

- Major household appliances production will be about the same as that in '57, with the possibility of a slight increase.

Describing the current economic downturn as a recession rather than a depression, Weber made these somewhat cheering observations: (1) the rate of decline in industrial production has approximated that of past recessions and has been well below that of past depressions; (2) prices of all commodities other than farm products and foods have, so far, been stable during the recession. This stability, he added, probably will continue throughout the remainder of the downturn; (3) paint- and varnish-consuming lines that are likely to be strongest in '58 include housing, major household appliances, refinishing and repainting.

## New Resins Source

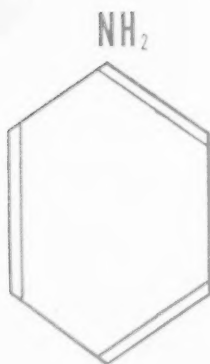
The recent licensing agreement between U.S. Polymeric Chemicals Inc. (Stamford, Conn.) and American Reinforced Plastics Co. (Los Angeles) should broaden the source of high-resistant resins necessary for the U.S. missiles program.

The agreement covers resins in the high-heat-resistance field, including 91-LD and 37-9X; the latter is a phenyl silane copolymerized product.

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Superiority of GROCO 2 RED OIL revealed in unretouched photograph of low temperature test. Samples of GROCO 2 (left) and competitive red oil (right) were refrigerated at 36°F. for 24 hours side by side. No solids separated out of GROCO 2 RED OIL—it remained so transparent that technician's fingers and steel tray are clearly visible through vial. On right, solid acids separated in large amount.

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GROCO 2 RED OIL's exceptionally low content of saturated fatty acids—titre 3°C.—is advantage enough in itself to make it top choice for many processors. More than one producer of a liquid shampoo, for example, prefers GROCO 2 because it gives a formulation that stays liquid at low temperatures.

Equally outstanding is its oxidation stability. In the Mackey Test, GROCO 2 remained under 105°C. for 5 hours. There are no oxidation discoloration problems when you formulate with GROCO 2. And there is an absolute minimum of unusable components, making GROCO 2 the best money value of any red oil in its class.

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## SPECIALTIES

Some missile experts regard these resins as about the best thing the U.S. has developed for overcoming the heat barrier encountered in supersonic flights. The satellite Explorer I carries three parts that use these materials, and the nose cone shown by President Eisenhower in a recent telecast was also made of it. As well as being used in Explorer I, these resins will be used on the Navy's Polaris and the Army's Atlas missiles.

Under the agreement, U.S. Polymeric Chemicals will be the sole source of these materials east of the Mississippi. Primary source west of the river will be divided between ARP and U.S. Polymeric Chemicals. They will provide a secondary source in each other's territories.

In addition to its new licensing agreement, U.S. Polymeric is building a plant in Utrecht, Holland, as a European source, and several of its plants in the U.S. will be expanded to handle the high-temperature materials.

## PRODUCTS

**Spray Dried Gluten:** Midsol Vital Wheat Gluten, said to be the first commercial spray-dried gluten made in the U.S., is now available from Midwest Solvents Co. (Atchison, Kan.). Midwest says production of the new product will exceed 300,000 lbs./month.

**Powder for Pools:** Living Products Co. (New York) is now marketing a bactericide powder, tagged Puro-Pool, for backyard swimming pools. The product's maker says it dissolves quickly, prevents algae formation, combats athlete's foot and deodorizes. Puro-Pool is available in 4- and 8-oz. polyethylene bottles and 3-lb. cans. Cost: 98¢/4-oz. bottle.

**Intermediates on Their List:** Catalin Corp. has entered the chemical intermediates and specialties field. It's marketing 14 of them: dinitrile azoisobutyric; Catalin UV-1 (a cinnamic aldehyde derivative); sodium amide;  $\alpha$ -amino pyridine; 2, 6, di-amino pyridine; mucochloric acid; parachlorometacresol; thiosemicarbazide; heptaldehyde; undecylenic acid; 11-bromoundecylenic acid; hydrazine sulfate; Catalin bacteriostat CS-1; and methylene aniline. Catalin's entry into the field came about through its recent



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## SPECIALTIES

cross-licensing agreement with Societe  
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• **Plastic-Foam Tape:** United Mineral  
& Chemical Corp. (New York) is mar-  
keting a new urethane-foam tape for  
both industrial and domestic uses. The  
product, tradenamed Tesamoll, is said  
to be resistant to oils and most chem-  
icals, highly resilient, and waterproof.  
It comes in rolls of 1/2-in. and 3/8-in.  
widths.

• **Throwaway Dust Rag:** Kemi-Kleen  
Cloth, a nonwoven dust cloth, has just  
been introduced by Lowndes Prod-  
ucts, Inc. (Philadelphia.) Principal in-  
gredient in the bonding mixture (the  
cloth's fibers are held together by a  
chemical bounding agent instead of  
being woven) is Chemigum latex, a  
water-dispersion of synthetic rubber  
made by the Chemical Division of  
Goodyear Tire & Rubber Co.

• **Plane Cleaners:** R. M. Hollingshead  
Corp. (Camden, N. J.) has just added  
three new products to its Whiz line of  
aviation cleaners. The products: Whiz  
2247, an emulsion cleaner for aircraft  
surfaces; Whiz 5672, a heavy-duty  
emulsion for cleaning planes before  
polishing; Whiz Hydromuls, a concen-  
trated water emulsion for removing  
exhaust stains.

• **Vinyl Stabilizers:** Ferro Chemical  
Corp. (Bedford, O.) is now offering

two new vinyl plastisol stabilizers in  
liquid form, Ferro 1701 and Ferro  
1720. They are designed to give good  
color retention and long-term heat  
and light stability. Ferro 1701, with  
0.90 specific gravity, is recommended  
as a one-package stabilizer for pig-  
mented and filled plastisols. Ferro  
1720, specific gravity of 1.02, is de-  
signed for heavy-duty, long-term sta-  
bilization. It's said to be an efficient  
heat stabilizer for casting, molding and  
coating clear, or pigmented and filled,  
plastisols.

• **Copolymer Beads:** Flexbond Beads  
Exp. D-13, a copolymer of vinyl ace-  
tate and vinyl stearate in bead form,  
are now available from Colton Chem-  
ical Co., a division of Air Reduction  
Co., Inc. (Cleveland.) Colton says the  
beads can be used in paper and film  
coatings, adhesives, inks, hot melts,  
and other specialties products.

• **Silver Germ-Killer:** Ions Exchange  
& Chemical Corp. (New York) has  
a new antibacterial compound for  
liquid shampoos, soaps and other toi-  
let goods. The new silver compound,  
tagged Agosan-H-6, is said to be odor-  
less, tasteless, noncorrosive and water-  
soluble.

• **Reinforced Teflon:** The Polymer  
Corp. of Pennsylvania will introduce  
Fluorosint resin, a reinforced Teflon,  
at the American Society of Mechan-

## Putting on a Polish with Nylon



U. S. housewives will soon have the  
opportunity to wax their floors, as  
well as their furniture, with nylon.  
Nylwax Corp. (Worcester, Mass.)  
plans to market in June a floor wax  
utilizing nylon in an emulsion form.  
It will cost about \$1/pt., according to  
Peter Gagas, president of Nylwax.

The four-year-old company is now  
pushing a line of wax polishes for  
furniture and autos, will soon sell  
them nationally. The furniture product  
retails at \$2/pt.; the auto polish, \$1.25  
for 8 oz.

One of the advantages claimed for  
the nylon-containing polish: it doesn't  
leave powder in cracks or grooves. The  
product is simple to remove, Gagas  
told CW; mild soap and warm water  
will do the job.

cal Engineers' design engineering show in Chicago, April 14-17. According to its maker, the new resin exhibits a two- to fourfold improvement in dimensional tolerances of molded parts over unmodified Teflon (polytetrafluoroethylene resin). Polymer says that Fluorosint has a thermal coefficient of expansion one-fifth that of Teflon, and can be quenched in water up to 700 F with negligible change in dimensions.

**Laminating Blend:** Borden Chemical Co. is marketing a new resin and wax concentrate, tradenamed M-1200. The new product, a concentrated blend of butyl rubber and microcrystalline wax, was developed as an additive to microcrystalline wax in the coating of heat-seal labels, for the lamination of glassine to boxboard and glassine to glassine.

**Mica/Epoxy Family:** Minnesota Mining & Mfg. has developed a new family of epoxy resin-bonded micaceous insulation for use with Class B electrical equipment. Tradename: Isomica-Epoxy.

**Fume Stopper:** Wagner Brothers, Inc. (Detroit), is now marketing Krome-On as a fume suppressor in metal-working plants. The product was developed originally to improve covering power and to reduce drag-out in chrome plating.

**Carbonyl Cleaner:** Sodium borohydride and potassium borohydride are now being marketed by Metal Hydrides Inc. (Beverly, Mass.) to remove trace quantities of aldehydes, ketones, peroxides from various liquid chemicals. The low-cost treatment will reportedly help clean up alcohols, esters, polyesters, nitriles, amines, ethers, cellulose pulps, olefins.

**Surface Defiler:** Fisher Scientific Co. (Pittsburgh) is out with two new solutions (iodine-methanol and iodine-methanol sulfosalicylic acid) designed to eliminate surface films on aluminum alloys. Both are inexpensive.

**Approved List:** Dodge & Olcott's (New York) 8-page catalog lists flavoring and perfume compounds approved by the Orthodox Union of Jewish Congregations of New York.



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**Technical Salesman.** Large manufacturer of synthetic resins and chemicals offers excellent opportunity in market development and sales of ACRYLIC EMULSIONS and industrial resins. Prefer man with technical resin experience and chemical background. Salary, expense and commission. P-7493, Chemical Week.

**Exceptional Opportunity!** Our rapid growth and scheduled expansion activities have created the immediate need in the Metropolitan New York area for a top-flight, seasoned man to fill an important position in our Chemical Sales Division. The man we are seeking is ready to assume responsibilities greater than those available to him in his present position. He is 30 to 40 years of age; he has had a minimum of 5 years sales experience in the chemical industry; and he is ready to move ahead with a company that has become the pace-setter in its fields. If you are qualified to take advantage of the opportunity and are ready to put your background and experience to their best use, we would like to know all about you. Please write in detail and, of course, in complete confidence, to: Chemicals Division, Reichhold Chemicals, Inc., 525 North Broadway, White Plains, New York.

### Selling Opportunity Offered

Salesman wanted industrial chemicals. The two Carolinas and Virginia. SW-7480, Chemical Week.

### Positions Wanted

**Under 45—Chemical Degree.** Over 12 years of successful sales and sales management. Very diversified experience including direct sales to chemical processors, petroleum companies and many other industries. Also to many types of jobbers. Very aggressive and very anxious for a growth opportunity. Willing to relocate. PW-7329, Chemical Week.

**Organic chemist, Ph.D., 25 years of versatile** experience in research and development, presently active in surfactant field, desires responsible position in which he can exercise his own initiative. Also willing to enter into an engagement as a consultant. PW-7460, Chemical Week.

### Selling Opportunity Wanted

Sales agency covering New Jersey, Penn., Del., Md., & Va. seeking new account. Technical group. High sales volume. Can warehouse. Will act as your agent or office. Lower your sales expense by contacting. RA-7492, Chemical Week.

# Tracers

TO THE  
CHEMICAL PROCESS INDUSTRIES

- **Displayed Rate—**  
\$24.50 per inch. Contract rates on request.  
Not subject to Agency Commission.
- **Undisplayed Rate—**  
\$2.10 a line; minimum, 3 lines.

## FORT PITT BREWERY

750,000 bbl. plant closed November.  
All equipment available for immediate delivery at attractive prices, write for free 16-page illustrated booklet

included 16 one-piece glass-lined tanks, stainless coolers, cookers, kettles, filters, Lastiglas-lined tanks, compressors, wood tanks, etc., attractive prices. Write to:

FORT PITT BREWERY,  
SHARPSBURGH (PITTSBURGH), PA.

## SURPLUS WANTED

CHEMICALS, PHARMACEUTICALS, OILS  
PLASTICIZERS, RESINS, DYES  
SOLVENTS, PIGMENTS, ETC

CHEMICAL SERVICE CORPORATION  
96-02 Beaver Street, New York 5, N. Y.  
HAnover 2-6970

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Spent Solvents — By-Products  
Plasticizers—Resins—Waste Thinners  
ABBEY CHEMICAL CORPORATION

45 Janet Lane  
Springfield, N. J. BRenzel 6-3230-1

## BUYERS OF CHEMICALS

CHEMICALS—OILS—SOLVENTS  
DRUGS—RESINS—WAXES  
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BARCLAY CHEMICAL COMPANY, INC.  
75 Varick Street New York 13, N. Y.  
WORTH 4-5120

## RED TOP BREWERY

Closed in November, Red Top Brewery Plant #2 in Cincinnati offers all equipment for sale. Write for free listing to exclusive liquidating agents:

CHAS. S. JACOBOWITZ CORP.,  
c/o Red Top Brewery,  
242 W. McMicken St.,  
Cincinnati, Ohio.

## CHEMICAL PRODUCTS WANTED

Known Chemical specialty manufacturer seeks experienced chemist or technician with proven developed specialty product for industrial use. We will finance as an independent subsidiary and extend ownership participation. Will also consider established specialty manufacturing firms with proven industrial products ready for expansion.

BO-7468 Chemical Week  
Class. Adv. Div., P.O. Box 12, N. Y. 36, N. Y.

### For Sale

Unused Buflovac 5' x 12' Single Drum Vacuum Dryer. Perry, 1415 N. 6th St., Phila. 22, Pa.

Fletcher 40" Suspended Centrifugal, Perforated Basket, stainless steel contact parts. Practically new. Perry, 1415 N. 6th St., Phila., Pa.

Bird 32" x 50" Solid Bowl Centrifugal. Steel contact parts. Late model. Perry Equipment Corp., 1415 N. 6th St., Phila. 22, Pa.

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P. O. Box 17 Urbana, Ill.  
EMpire 7-8406

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Chemical plant design. Feasibility and Market studies.  
Specialists in Pacific Coast chemical industry.

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Professional Engineering for the Petroleum and Process Industries

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Greenville South Carolina

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in solving your most difficult problems is offered by consultants whose cards appear in this section.

### For Sale

One 5 high 30" Desolventizer Toaster. Mfgd. by The French Oil Mill Machinery Co. Ideal for pilot plant or small production. Condition near new; used briefly in pilot operation. Reply to Nutrilite Products, Inc., Buena Vista, California.

For Sale—"U.S. Bottlers" combination Loadomatic unscrambler and rinser, Style US-17, cap. up to 300 bpm, reconditioned. FS-7494, Chemical Week.

Yeast Dryer—Fischer rotary yeast dryer, Model 36/40, with pulverizer, elevator, still erected in plant in Eastern Pennsylvania, complete details by writing. FS-7499, Chemical Week.

For Sale—Sparkler Model 18-D-12 filter, complete with pump, filtering area approx. 18½ sq. ft., takes space 2.7 cu. ft., cap. 1000 gph. FS-7504, Chemical Week.

### Business Opportunity

Esterification Plant Wanted. Will buy or rent. Give particulars. BO-7487, Chemical Week.

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San Francisco 4	William C. Woolsten, 68 Post St., DOUGlas 2-4000
St. Louis 8	3415 Olive St., Continental Bldg., R. J. Clausen, JEW-ersoon 5-4907

## CHARTING

## BUSINESS

March 15, 1958

Index:  
1937 = 100

250

200

150

100

50

## Total Pulp and Paper Output Up

1937

'42

'47

'52

'57

Source: National Council for Stream Improvement (of the Pulp, Paper, and Paperboard Industry).

## Pulpers Pace Gains in Pollution Control

The CPI is gaining in its stepped-up drive to control water pollution. Prime example is the pulp and paper industry, one of the largest water consumers.

While total pulp and paper production has soared nearly 120% since 1937, the average water pollution load (in terms of bacterial oxygen demand) has been cut nearly in half.

Pollution from wood-pulping sulfite wastes, among the most objectionable contaminants, has been sharply curbed by changes in manufacturing processes. Some sulfite plants have switched to use of magnesia, ammonia or soda ash in place of conventional calcium

bisulfite. These changes make it possible to recover alkali and sulfur, destroy the organic substances in waste liquors.

Another trend providing marked improvement over the '37-'57 period: treatment of sulfite wastes. This generally involves a three-stage chemical precipitation with lime, yields products that can be reused.

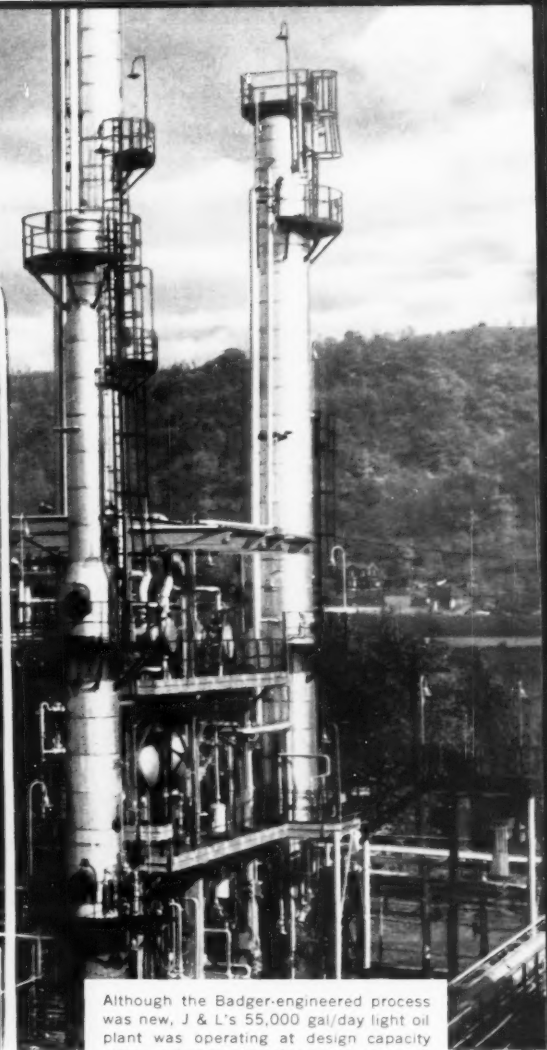
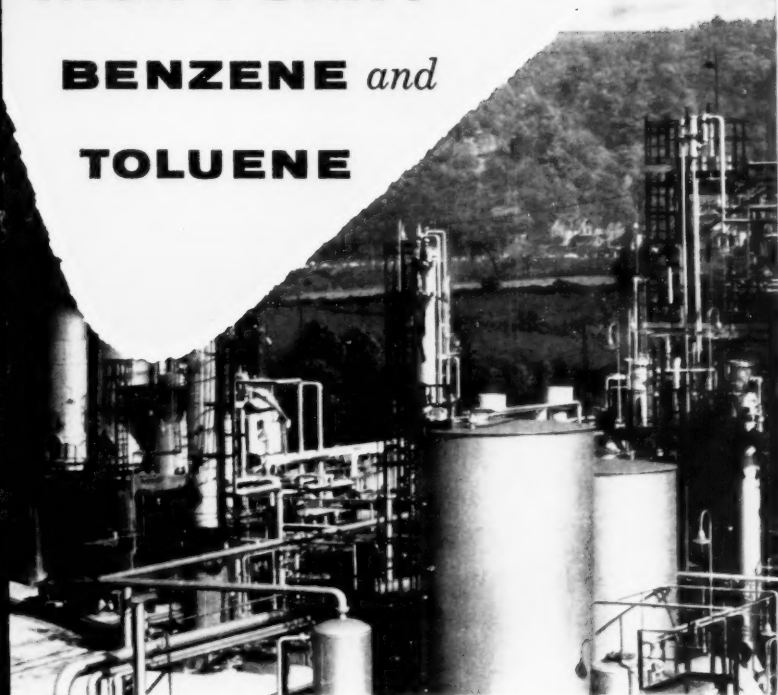
Modern practice is to recover certain contaminants found in papermaking effluents—fillers, sizes, dyestuffs, glues, caseins, etc.—rather than discharge them into the nation's streams and waterways. This all adds up to a continued downward trend in water pollution.

# REVOLUTION IN COAL CHEMICALS:

## HIGH PURITY

## BENZENE *and*

## TOLUENE



Although the Badger-engineered process was new, J & L's 55,000 gal/day light oil plant was operating at design capacity within a few weeks after initial start up. This plant marks the first time Esso's Hydrofining and Universal Oil Products Company's Udex processes have been adapted in combination for coal chemical operations.

### Acid washing eliminated in new plant built for J & L by Badger

TEELMAKERS, saddled with conventional processes, have been hard pressed to satisfy market demands for near absolute purity benzene and toluene at low cost.

Jones & Laughlin Steel Corporation, looking for a solution to this critical problem, turned to Badger for engineering counsel. Their combined decision: A completely new type plant based on processes proven in other industries but new in coal chemical operations. Now on stream, J & L's new plant is producing benzene and toluene of higher purity than similar products derived from any other source.

What's more, this pioneering plant promises important operating economies. Hydrogenation has been substituted for the conventional acid washing step. This important process improvement not only increases amount of product recovered but also eliminates a source of high maintenance costs. Also, the plant and its controls are completely integrated with other process units for labor saving operation.

The broad experience of Badger Engineers — and their ability to use it in solving new problems — served J & L well. Many other clients, too, say such experience is a Badger difference that "makes the difference." Wouldn't it be wise to inquire how it could serve to make your engineering and construction projects more successful?

#### THE BADGER KEY MAN

From initial negotiations to "on stream" you deal with a Badger principal. Badger Engineering projects are group efforts headed by a Key Man. More than just a sales engineer, he is always a Badger principal, always the Key Man in the execution of your project.

By channeling project liaison, coordination and administration through a widely experienced company principal, you find many policy level decisions can be made *on the spot*. Investigate what Key Man Policy can mean to the projects you are planning.

## BADGER

MANUFACTURING COMPANY

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230 Bent St., Cambridge, Mass. • New York, N. Y. • Houston, Texas

In Europe: Badger-Comprimi N. V., The Hague  
Badger-Comprimi S. A., Antwerp

*From Heyden Newport*

## A Full Line of NUODEX Organic Peroxides and Accelerators



*Today's pleasure craft — a booming market for reinforced polyester resins catalyzed with organic peroxides.*

*Nuodex also serves the plastics industry as a major supplier of metallic stearates and a complete line of heat and light stabilizers for vinyls — the Nuostabes®.*



*Where tradition meets tomorrow in chemical progress*

### BEZYOYL PEROXIDE

Granular 96%

### TECHNICAL LAUROYL PEROXIDE

### M. E. K. PEROXIDE

60% Methyl Ethyl Ketone  
Peroxide in Dimethyl Phthalate

### B. P. PASTE

50% Benzoyl Peroxide with Tricresyl Phosphate

### SILICONE CATALYST NO. 1

50% Benzoyl Peroxide with Silicone Oil

### SILICONE CATALYST NO. 2

50% Benzoyl Peroxide with Silicone Fluid

### PARAMENTHANE HYDROPEROXIDE

### COBALT ACCELERATOR 6%

(DMR Process)

Select your organic peroxides and accelerators from the full Nuodex line. You can depend on Heyden Newport to supply any of the above peroxides when and where you need them.

Also available — Heyden Newport's expert assistance in product development and evaluation. This service through the Nuodex Division Application Research Laboratory is backed by the research and development, and multi-plant facilities of Heyden Newport Chemical Corp.

Your supplies of Nuodex organic peroxides and accelerators will be delivered promptly from warehouses strategically located throughout the country. 25 years of leadership in manufacturing additives and Special Purpose Chemicals is your assurance of high quality and uniformity. Write today for the Nuodex catalog. Laboratory samples are available on request. Nuodex Products Company, Elizabeth, N. J.